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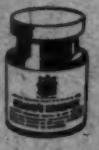

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BRITISH MEDICAL JOURNAL

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PROFESSIONAL PROSPECTS*

A COMPARISON OF THE POSITION OF DOCTORS WITH THAT OF OTHER PROFESSIONAL PEOPLE

BY

ROY LEWIS

Struggling with the problems precipitated by the National Health Scheme, the doctor may often be tempted to think that his difficulties are unique. Lawyers, architects, engineers, accountants, schoolmasters, and artists, he may concede, all have their troubles—but, whatever they are, they are not likely to have much bearing on medical professional problems, whose solution can be sought only by doctors wrestling alone with their professional consciences or collectively with the Ministry of Health. But though it is no doubt true that only doctors can solve the problems and resolve the dilemmas which face their profession, a study of the contemporary difficulties of all the professions suggests that doctors share many of their perplexities with lawyers, accountants, engineers, and so on; and that in shaping their course for the future all the professions can gain greatly from a common awareness of each other's position. For the same social tendencies which have made a national health service inevitable have been changing the status and prospects of the other professions. The basic objectives of nearly all professions are the same. May they not have a good deal that is useful, when planning action, to learn from each other? May they not have, even, interests that they should defend together rather than separately?

Industrial Revolution in Medicine

The National Health Service is the latest development in the long social history of medicine. In the past hundred years medicine has undergone an industrial revolution analogous to that undergone by other techniques and callings. The general practitioner has survived, as the hand-loom weaver has not (except in Harris), but a large part of the functions he discharged a century ago have been taken over by the organized medical factory—that is, the hospital and clinic—where specialists of many sorts, not all of them doctors, cooperate to bring any part of the whole range of medical science to bear on every single patient, which would now be impossible for one practitioner alone. In these circumstances the G.P. tends to become a sort of preliminary first-aid casualty-clearing station, plus an organizing and educational centre; anything "big" goes to the "health factory." The G.P.'s function, however, remains a key one—but it has demonstrably changed. That is, broadly, the picture of a hundred years of medical organization, brought about by profound changes in technique and a galactic expansion of scientific knowledge. But one important factor is left out of this equation—and that is the growth of the idea that every citizen in a modern scientific welfare state has a *right* to enjoy the very *best* service that the current state of medical science makes possible.

The idea of the right to health is part and parcel of the idea of equality of opportunity, equal shares (or fair shares), full participation in the material benefits of a scientific civilization. The Labour Party manifesto in the 1950 election stated explicitly: "Labour has set out to convert into practical reality the Socialist ideal that the best shall be available to all." The illogicality of the statement is significant, but it is sufficient to note here that any such idea would have seemed nonsense in fact as well as in wording a hundred years ago. Then, it was thought reasonable that you could have as much medical attention as you could pay for—that you could have just as much of *any* professional service as you could pay for. Almost all professional men worked, like doctors, as individual practitioners and fee-takers. The State hardly even "laid on" defence—even Army officers purchased their commissions under an archaic conception that the Army should somehow pay for itself. Community doctoring—"public health"—was in its veriest infancy: something Edwin Chadwick was still fighting to make effective.

Expansion of State Services

What has happened since to medicine has happened, to a greater or less degree, to every other profession as the result of these two forces—namely, scientific advances and the idea that every citizen ought to have the benefit of them. The obvious case is teaching; the Education Acts of 1870 to 1902 began the process of providing everybody first with a minimum education and then working towards the idea of giving everybody a maximum education—a full training for his or her trade and profession—laid on free. But every profession has been affected. State health and State education have between them swept many other professions into State service, and even created several new ones—the obvious cases are the dentists, pharmacists, opticians, nurses, medical auxiliaries of all kinds, and the social workers. Something similar is happening to

*This paper, which was read before the Hertford Hospital Medical Society, is based on material for a forthcoming book, *Professional People*, by Roy Lewis and Angus Maude, M.P., to be published by Phoenix House, Ltd., next autumn.

the scientists, whether industrial chemists, physicists, botanists, or biologists. In the mid-nineteenth century, scientists either taught in universities or worked in their own laboratories in moneyed seclusion. For the public to get the advantages of their services they had to be pulled into the light of day and organized—first, of course, by industrial firms who put money into research, but increasingly by the State, which is to-day probably by far the largest buyer of scientific talent. The State "lays on" science—whether in defence, in food production, in hygiene, in agriculture (home and colonial), or in State industry. The Government operates about 600 research establishments, and in 1945 formally created the "Scientific Civil Service": science as a public service, in short, like medicine or education.

In law we find the same process at work. The first attempt to give "fair shares" in law, as in medicine, finds its expression in the legal aid scheme. The idea of a State legal service is being applied cautiously; it was because every man paid for his own law that an independent judiciary arose in Britain. The dangers of free State professional services reveal themselves most nakedly in law. None the less, the present half-way house is not in line with the spirit of the age—there is a means test, for example. The pressure for more free legal aid, and certainly free legal advice, is increasing.

Rise in Cost of Professional Services

The reciprocal of State-paid professional services is that the cost of professional services has steadily risen, and continues to rise. This is not a matter of fees (most legal fees have not risen since the 'eighties) but of the cost of organized professional services, and the greater scope of them: innumerable regulations compel the citizen to call in, or make use of, the services of medical officers of health, borough surveyors, accountants, and engineers and scientists of every kind. The fact that the salaries of these experts are paid from rates and taxes does not make them less expensive or less active; and, indeed, their education and training, also increasingly paid from taxes, gets steadily more expensive. This is an important contributory cause to high taxation, which has wiped out the upper classes and is eating into the status and the slender but widely distributed capital reserves of the middle classes. The consequence is that not only has the cost of professional services risen above the ability of the average citizen to buy them, but even the better-to-do can no longer find the money for professional fees. At one time both lawyers and doctors could aid the poor freely or cheaply because they could charge the rich or middle-class client "what the traffic would bear." To-day the voluntary hospital system would have broken down in any case, because the public has no longer a sufficient margin of income for "voluntary contributions."

The result is a steady growth in the proportion of professional people in direct State employ, in local government employ, or in the service of indirect State organizations such as the Health Service; the corollary is the ever-smaller proportion of each profession in private practice as it is traditionally understood. Before the war, 40% of the average income of a general practitioner came from panel patients; to-day the average proportion of medical income from purely private patients is tiny—there are some 600 private practices outside the Service, and an unspecified number of private patients going to doctors in the Service. If the income of medical men from outside the Service were 10% of the total it would surprise most of us. But to-day only 52% of registered architects are in private practice; and over a third of the membership of the Society of Incorporated Accountants and Auditors are in public service, a proportion which may not be untypical of the other accounting institutions. Moreover, the dependence of private practitioners (lawyers, architects, consulting engineers, and consultants of all kinds) everywhere on Government or local government work is well known. How can it be otherwise when the State spends nearly half the national income? In professions where the State does not, in fact, buy much of the professional services offered, a very difficult position exists: only a handful of writers and authors can make a living by their literary work, and hardly a painter or sculptor can live by his art alone; the great majority must find subsidiary incomes, by teaching, by commercial work, and so on. The death of artistic patronage is only one symptom of the general condition which is driving the professions slowly into State employment.

What, then, does State employment imply, and by what means can it be made tolerable to professional ideals? We may examine three important ways in which State employment—and strengthened State control—affects the professions: first, freedom and ethics; secondly, administration and organization; thirdly, remuneration. All professions are affected to a greater or less degree.

State Employment: Freedom and Ethics

The basic professional relationship is between practitioner and client: it is ethical and fiduciary.* It emerges most clearly in the medical profession, because the most precious thing a man has—his life and health—is commonly the subject of the contract between him and his medical adviser. Hence the professional ethic is most highly developed in medicine, and with it is achieved a degree of altruism (however far short of the ideal some, or even many, doctors may fall) not approached in any other profession. Perhaps for this reason the medical code has profoundly influenced the professional conduct of other professions which developed later. The legal ethic is most nearly comparable to that of the medical. The interest of the client comes first; indeed, as Anthony Trollope remarked in *Orley Farm*: "No amount of eloquence will make an English lawyer think that loyalty to truth should come before loyalty to his client." Among barristers there exists the obligation to serve; in the Law Society and the Bar Council there exist well-developed disciplinary bodies to deal with any practitioner offending against the code, and for maintaining the profession's standards.

It may be argued that the altruism of doctors is not found among lawyers; but in fact the history of law is that of the upholding of individual rights and the maintenance of the independence of the judiciary; the benefits conferred by the English legal profession upon the community have been immense. In other professions the ethical relationship narrows in content, but it is preserved in the relations between client and practitioner. The most important element in the codes of other professions is the guardianship of the client's financial and material interests—for example, the architect, because he must supervise his client's outlays upon building, has a circumspect attitude to observe in his behaviour towards the contractor. An architect working for a contractor may no longer describe himself as an architect. Like a consulting engineer, chemist, accountant, or chartered estate agent, he can be remunerated only by his fees, accepting no commissions, indulging in no advertising.

Many professional people, however, have no individual clients—they are in salaried employment. Their clients are a firm or a Government department. Does this not change the ethical basis of professional service? The question becomes of importance when doctors or lawyers are employed by the State, for a clash of interest may occur—and in fact sometimes does occur—between the employer and the

*There are some possible exceptions to this rule, though the Royal Commission on the Press, for example, considered it held good even for journalists; in the case of the artist, too, the professional services given are such that "the professional must be trusted to give what he cannot be compelled or contractually bound to give" (T. H. Marshall, *Citizenship and Social Class*, p. 135).

individual for whom the employer is laying on the service. Ultimately the patient or client is the employer—through the part he plays in representative Government—but in fact Departmental policy and the machinery of administration put a huge barrier between the citizen as consumer of some social service and the citizen as employer of the man who dispenses it to him. Some people have taken the view that the old ethic which existed between client and practitioner is in some way "sublimated" by professional people in Government employ to a general obligation of self-abnegating service to the community at large. It was Lord Dawson of Penn who remarked: "A doctor's vision, hitherto focused on the individual, will extend its range so as to embrace the community. Professions, like individuals, have their phases of development. In the medical profession to-day we see the dawn of the civic conscience."*

The Professional Conscience

All professions should have a civic conscience—in proportion as they receive, by Act of Parliament or Royal Charter, special privileges and protection; they are under the obligation to maintain the standard of their service and to advance in the public interest their science or their art. Obviously true of medicine, this is no less true of engineering, law, applied science, or even architecture and art. Professional institutions and individual professional men must play an ever-increasing part in shaping social policy—through representative organs of Government. But this is far from superseding the basic ethic—which is the fiduciary and confidential relationship towards the client, whose true interests are paramount. From this it should follow that, whatever the duties of medical officers of health, or medical advisers in Government departments, what really matters to the doctor—G.P. or specialist—is the patient, not the paymaster. The lawyers have taken care that payment under the legal aid scheme shall be disbursed by the Law Society, though it comes from the Treasury; this arrangement emphasizes the fact that the practitioner must not be influenced by any loyalties other than those to the client. It should certainly not be assumed that "among reasonable men," such as Civil Servants and other professional people account themselves, no clash of loyalties may be anticipated. Anyone with experience of working with large organizations knows they do take place; all professions find it so. And what starts with small matters goes on to major points of principle. An interesting but by no means isolated example is that of the probation officer, a servant of the Court, who comes to think of himself inevitably as "treating" the offender in a confidential capacity, and often finds a conflict between his instructions from the Court and what he sincerely considers are his "client's" best interests.†

Professional people in salaried positions should feel that they belong not to their immediate paymaster in matters of conduct but to their profession, but what makes this profession, and its code, is the tradition of private practice. The danger is that, if private practice should dwindle below a certain critical point, that tradition may lose its power over new generations of students and graduates. The tendency to think more of the employer's interests and less of the client's may be speeded up as the "expert" finds himself in charge of an ever more complex machine for doing good generally, instead of looking after Mr. Brown and Mrs. Smith and Master Robinson in particular. For this reason the present position of the general medical practitioner is of special importance. In the Health Service the doctor–patient relationship will remain, while some private practice in the old tradition will survive outside it and in competition with it; and in medicine, therefore, the true professional conscience can be kept alive, and can set the tone, not only for the rest of the medical profession, but for all the professions which try to take their tone from the medical ideal. The general practitioner who insists on acting as the patient's servant first and foremost is performing a first-class service not only to the medical profession but to all the others in which the State is gaining power at the expense of the private practitioner.

Organization

The second effect of growing State power is upon organization. Professions should be self-governing, whatever stipulations the State may make regarding the nature of qualifications or of conduct: this follows from the practitioner–client relationship, for only the profession knows how best to preserve trust in itself. It demands independence. Where there is no independence there is trouble. Teachers suffer from a lack of true professional organization: bossed by the Ministry of Education and local authorities to an unreasonable degree, humiliated in pay and status—even inspected to make sure they are not scamping their professional duties—they have taken refuge in trade unionism. That is the danger which faces all professions to-day, and many are alive to it. It is interesting to note that the nationalization of mines has been followed by the development, on the part of mining engineers, of the Institution of Mining Engineers as a fully examining and qualifying body. Now that the State controls the mines, besides setting the standard of the certificate for colliery managers, the profession instinctively feels it must develop its independence through a body free from the State and capable of maintaining higher standards. The gas engineers have reacted to gas nationalization from similar professional instincts. When there were 1,000 gasworks as separate employers, the Institution of Gas Engineers accepted a subsidy from the gas companies to act as an examining and professional body. To-day that subsidy comes entirely from one source—the State—and the gas engineers have reacted by handing the control of examinations and qualifications over to the completely independent Institution of Civil Engineers.

The State has an inveterate tendency to do things on the cheap; to do things on the cheap it is necessary to lower standards. The proposals to introduce a new series of qualifications for engineering, technology, and commerce, based not on the training and examinations of the existing senior engineering, scientific, and accountancy institutions but upon an entirely new system of State technological education, is being strenuously opposed by the older professional bodies, who see in it a threat both to their independence and to the educational standards in their professions. They anticipate that it would not be long before State-certificated engineers, accountants, and technologists would be employed in Whitehall departments, in local government, and in nationalized industries in preference to properly qualified men and women; cheap engineers, in fact, to match cheap teachers. There may appear at present to be little danger of State production of cheap doctors—but this tendency should be watched and fought.

The Threat of Administration

The other threat from the State to the independence and integrity of the professions comes from the growing importance of administration. When all professions consisted of private practitioners there was no administration. The only administered professions were the Army and Navy, where an interesting mixture of anarchy and red tape was the rule. The introduction of social services, the socialization of professional work, bigness, centralization on Whitehall, technical advances, have completely changed the picture. Doctors found themselves faced with the choice either of getting their hospitals managed by laymen, and devoting themselves to their patients, or of reducing their professional work in order to find time for administrative duties. The engineer has to decide, likewise, at what stage to cease designing machines and become a manager or an administrative officer; the scientist must also forsake research in response to the same call, or acquiesce in the "co-ordina-

*Francis Watson, *Dawson of Penn*, 1950, p. 171.

†Cf. *Social Case Work*, edited by Cherry Morris, 1950, pp. 127 *et seq.*

tion" of his and his colleagues' work by a layman and perhaps even an accountant. Administration is gobbling up professional talent at a phenomenal speed.

There are two schools of thought about this. One school holds that an entirely distinct profession of administrators should be created to enable the technical people—doctors, nurses, medical auxiliaries, engineers, teachers, scientists—to get on with their "real job": selected, trained, and examined for management, these administrators should "run" the technicians efficiently and expertly. The second school holds, on the contrary, that professional people must themselves do the administration of their professional services to the community; whatever the cost in personal frustration, they must never relinquish control, for they alone can understand or discover how to organize themselves. This school avers that the conception of a distinct profession of managers and administrators is vague and illogical. The universities have firmly kept out the professional manager; the scholars run themselves—and thereby preserve a large measure of independence despite State finance of university teaching and research.* In medicine, while there is still much administration by doctors, and always will be, a new administrative profession is being allowed to grow up. In big business, it is still being argued whether managers should be trained to administration and then be put in authority over scientists and engineers, or whether the technicians should be advanced to top management if they reveal flair for organization and leadership.† Government and business experience strongly suggests that where you have administrators organizing the work and conditions of service of professional people you have among the professional people a strong sense of frustration, and a conviction that the administrators are inefficient, fussily tyrannical, and grossly overpaid in relation to professional earnings. The administrators in these circumstances are often defensive and irritable, or intolerably cocky.

There can be little dispute that one race of trained administrators we must have—the administrative grade of the Civil Service to enforce the laws and regulations with justice and efficiency; although, as the State increasingly enters the field of social services and production, "professional Civil Servants"—doctors, lawyers, accountants, and technologists—must increasingly be advanced to administrative posts otherwise held by departmentally trained administrators. But in local government there is no "heaven-born" administrative grade; and it has not been proved that such a grade or specialist is required anywhere else. On the contrary, there is every evidence that a sound professional training, whether medical, legal, or technological, supplies the best foundation for the development of the personalities and powers of those with gifts for organization and leadership. Only a limited proportion of people with professional or any other training show such a flair for organization and leadership; too few, indeed, to fill the many posts of supermen which the welfare state and the Socialist cult of bigness in organization create. This is the inherent weakness of bigness, however, and the training of administrators will not mend it. On the other hand, it is vital that the professions should retain their own government in their own hands, even if, in the case of medicine, this means losing hundreds of first-class doctors to desk work.

Professional Remuneration

In Mr. Attlee's phrase, we are trying to do too much too soon; that is the reason why almost every profession, except the stage and letters, complains of being undermanned. Our aim is apparently to give the country a higher, more expensive standard of life and welfare, equally shared, than our supply of brains, administrative and professional, will run to. It is important to note that, politically, what matters now is to give everybody *some* sort of service, even if this involves a drop in the standard. Politicians want to be able to *say* they have done this and that—that it is on paper, written in the Statute Book. Generally, their attitude to standards is that the masses probably don't know any better, and will take what they are given provided they do not see others getting more. This attitude has important consequences for the remuneration of professional people. What the State wants is enough doctors to run some sort of free health service, enough teachers to run some sort of universal free education, enough lawyers to run some sort of free legal aid scheme, and so forth. There is just so much money for all these welfare services, and to the State quantity matters more than quality. The result is that the State looks with a jealous eye on professional salaries. The traditional desire to save public money is now reinforced by new pressures to lower professional remuneration—one of them being the expense of complex administration, and another being the egalitarian spirit of the times. Moreover, if standards are lowered, it follows, to the official way of thinking, that a cheaper type of "expert" can be employed to supply the service in question.

So long as private practice and forms of alternative professional employment exist, it is possible to resist this tendency. The State is getting inferior scientific and technological talent because it offers salaries inferior to those obtainable in large firms and conditions infinitely irksome when compared with those prevailing either in industry or in the universities. With growing State control of secondary education, we see a narrowing of the wages differential between schoolmasters with university degrees and those with teachers' certificates only. It is rumoured that in gas and electricity, as senior posts become vacant, less well qualified engineers at lower grades of salary are put in charge. When this process reaches the coal mines (and those who have seen the material now being trained as colliery managers for the future are not reassured) and the nationalized steel industry (if it remains nationalized) the nation will feel the effects. Many of the best technologists have deserted coal, and some are thinking of deserting steel; there are, of course, many posts in private industry at home or overseas for them to fill. So long as alternatives exist there will be a limit to what the State can do to earnings in any one profession. If it lowers standards and remuneration too fast, moreover, it is likely in some cases to increase outside competition. The first effect of the 1944 Education Act, which foreshadowed a reduction in the quality of grammar-school education, was to lengthen the waiting-lists for private schools; while the queues for hospital attention in the Health Service seem to be significantly reviving medical private practice outside the Service. This competition, of course, is something the State will smash if it can: it is necessary only to refer to the behaviour of the Road Haulage Executive towards private hauliers, or the State airlines' attitude to charter companies.

Conclusion

It was Babeuf, the French revolutionary, who cried: "If it destroy civilization itself, we must have absolute equality." Absolute equality in professional services might well destroy their humanity with their progressiveness. To retain their humanity, to maintain their progress, each profession must keep its independence so far as it can; and when it is necessary to make difficult choices—the problem of old people, the problem of the school dental service, and so on—it is the profession, not Civil Servants or professional managers, who generally should make them. What money the nation can afford for health services should be spent by doctors, in the way they think best, in the terms of their own professional ideals. That such a decision shall be wise, and be made from good motives, our need of an independent medical profession is second only to our need of an independent judiciary. It is therefore vital, not only in their own but in other professions' interests, that doctors

*D. Veale, "University Administration," *Fortnightly Review*, November, 1951.

†Peter F. Drucker, *The New Society*, 1951, pp. 194 *et seq.*

should not allow Health Service conditions to undermine their independence or their essential relation to patients.

If my analysis of the professional situation to-day is reasonably accurate, a number of things will be necessary; important among these are:

(*a*) Medical organizations should spend the money allocated by the State to the National Health Service; doctors should be employed by doctor-administered organizations.

(*b*) Standards of qualification and performance must be defended.

(*c*) A stand must be made against the lowering of rewards, but public sympathy for such a stand must be developed by sound public relations.

(*d*) A realization by specialists and hospital doctors of the true importance to the profession of the general practitioner inside the Service: if the G.P. loses caste the public will tend to think of all medical men as mere purveyors of wrapped-up scientific cures, payable at shop clerks' rates.

(*e*) A realization by all doctors in the Service of the great benefits to be gained by the whole profession from the survival of private practice outside the scheme. It is a sound insurance policy; the profession should do all it can to extend every possible aid to the private practitioner, and fight the State's attempt to penalize him.

(*f*) The reconciliation of differences between doctors and medical auxiliaries. The medical auxiliaries' status and standards should be raised; and the State given no chance to drive any wedges between the "health professions."

(*g*) A new approach to administration. Every profession faces here a problem of unexampled urgency. It is foolish to leave the field to lay administrators. There is certainly need for a staff college for the scientific and technical professions; and probably one for the medical profession and all its auxiliaries as well.* How many hospitals have sent doctors to the administrative staff college at Henley meanwhile?

(*h*) And, finally, the maintenance by every means, personal and propagandist, of the basic ethical relationship between doctor and patient. People basically do not want official doctors, and they might well learn to prefer a less generous Health Service to losing the sort of doctor they traditionally know, like, and trust.

Let us make no mistake, when all professional people are officials there will be no doctors, no lawyers, no artists, and probably no scientists either. There will be no professions; and no life worth living. George Orwell in his *Nineteen Eighty-Four* depicted the sort of life there will be.

One other thing is needful: greater understanding by the professions of each other's problems, and the making of a common stand when this proves practicable. The leadership of this country is now largely professional. The aristocracy is gone; the propertied classes are dying; business is half-professionalized. The bureaucracy is calling in the professions more and more. Should not, then, professional leadership be consciously professional? Professional training and practice gives a man or woman a maturer outlook on affairs than is possessed by any other section of the community; in understanding the professional ideal (largely shaped by generations of doctors) and in seeking to pass it on to the rest of the community—to the business men, to the traders, to the farmers, to the technicians, to the trade union executives, and so to the operatives, supervisory, skilled, and semi-skilled—we have our best chance of restoring balance and vision to our community, which, packed fifty million on this small island, is so sorely beset.

*Cf. *The Times*, November 7, 1951.

HORMONE ASSAYS IN NORMAL AND ABNORMAL PREGNANCIES*

BY

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The accompanying list (see Table) of hormones of actual or potential interest in pregnancy is a formidable one, and is not necessarily complete. Assay methods for several of them are still imperfectly developed, so that it will not be possible (or necessary) to devote equal attention to each of them. A word of explanation, though scarcely of apology, is perhaps necessary in the case of the last two items, the enzymes histaminase and pitocinase, included within parentheses. Hormones and enzymes have a good deal in common, so that their presence in the list is perhaps not so surprising, and their presence in blood only during pregnancy entitles them to some consideration in this paper. The plan to be followed will consist of a description of the findings in normal pregnancy first, followed by a survey of what is known of the hormonal findings in abnormal pregnancies.

Table of Hormones in Pregnancy

- Oestrogens:
  - Oestradiol
  - Oestrone
  - Oestriol
- Progesterone—Pregnanediol
- Chorionic gonadotrophin
- Pituitary hormones:
  - Anterior-lobe hormones:
    - Prolactin
    - Growth hormone
    - Adrenocorticotrophic hormone
    - Thyrotrophic hormone
  - Posterior-lobe hormones
- Adrenocortical hormones:
  - "Corticoids"
  - 17-ketosteroids
  - Other cortical metabolites
- Thyroid hormone (serum precipitable iodine)
- (Serum histaminase)
- (Serum pitocinase)

Oestrogens

Although wholly satisfactory methods for the assay of oestrogens in body fluids still await development, and estimates of their levels in conditions other than pregnancy must be accepted with great caution, there is no doubt that such a plethora exists in pregnancy that even crude methods have yielded highly significant information. The general pattern of oestrogen excretion in the urine during normal pregnancy is now generally well known and needs little comment. As can be seen in Fig. 1, during the first trimester the levels are low, scarcely differing from those of the menstrual cycle, but thereafter a tremendous increase occurs in the oestriol fraction, and a very much smaller increase in the oestrone and oestradiol fractions. During the last two weeks the oestriol fraction decreases rapidly, reaching early pregnancy values by the onset of labour. The oestrogens are excreted almost exclusively in the combined form, as sulphates or glucuronidates, and as such are biologically relatively inactive.

* Paper read at the International Congress of Clinical Pathology, London, July 16–20, 1951.

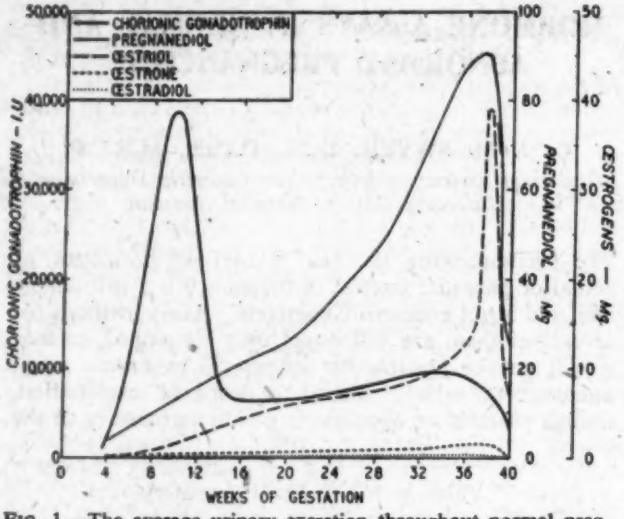


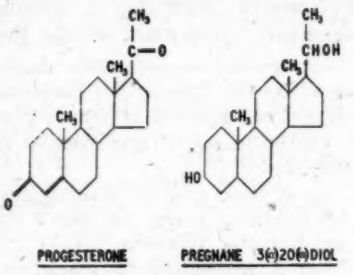
FIG. 1.—The average urinary excretion throughout normal pregnancy of chorionic gonadotrophin, pregnanediol, oestriol, oestrone, and oestradiol.

Since the work of Cohen, Marrian, and Watson (1935) it has generally been accepted that at the onset of labour, when the level of combined oestrogens has fallen markedly, free oestrogens suddenly appear in great excess. It has been thought that a causal connexion between the onset of labour and this change in the chemical state of the oestrogens might well exist. On the other hand, not all authors have invariably found such a rise in the free oestrogen at the onset of labour, and some doubt has therefore arisen whether or no such a rise was indeed significant. The recent investigations of Clayton and Marrian (1950) have shown that the explanation of the observed appearance of large amounts of free oestrogen at the onset of labour is contamination of the urine with blood or amniotic fluid. These substances contain large amounts of enzymes—notably glucuronidase—which are able to hydrolyse the conjugated oestrogens. So passes another plausible, but unfortunately incorrect, hypothesis seeking to account for the onset of labour.

The oestrogen content of the blood during pregnancy has been less studied than that of the urine, because it is much more difficult to obtain even remotely plausible results. It seems probable, however, that the blood levels vary similarly to the urinary levels. It is pertinent to point out that most of this work has been done with the use of biological assays; if these are not preceded by fractionation into the three oestrogens, interpretation of the oestrogenic potency of the mixture in terms of a single oestrogen (usually oestrone) is very difficult, since the potencies of the separate oestrogens are different, vary according to the method of assay used, and are not additive. Moreover, there may be present augmenting and inhibiting substances, about which knowledge is meagre. In most published studies little or no attention has been paid to these aspects.

Progesterone and Pregnanediol

If we take into consideration the difficulties of assaying progesterone—which still await adequate solution—it is surprising how much we know, or think we know, of the role of progesterone during pregnancy (see Kaufmann, Westphal, and Zander, 1951, for a recent review). Virtually none is present in the urine—and there does not seem to be much in the blood either. The corpus luteum during the first trimester, and the placenta in increasing amounts thereafter, do contain it. Most of our information is derived from studies on the urinary excretion of pregnanediol—a dihydric alcohol first isolated from pregnancy urine in 1929 by Marrian, and, since Venning (1937, 1938) described her gravimetric method for its estimation, the subject of numerous investigations. It has been assumed, more or less tacitly, that the pregnanediol excretion in the urine reflects the metabolism of progesterone (see formulae for the close chemical relationship between the two steroids). Very probably this is in general true, but the complete proof is still lacking, and it is conceivable that, in some circumstances at least, the parallelism is far from close.



Pregnanediol is excreted in the form of sodium pregnanediol glucuronidate, and in the original Venning method is measured as such. Most of the more recent assay methods have combined hydrolysis with extraction and thus determine free and combined pregnanediol together. This is advantageous, since partial hydrolysis may take place in the voided urine, thus causing variable losses of pregnanediol glucuronidate. It would be out of place to discuss in detail the various assay methods which have been developed in recent years, but, disregarding the older techniques, it may be said that they fall into two main groups—"rapid" methods, intended for clinical application, and quite unsuitable for dealing with the small amounts of pregnanediol found during the luteal phase of the menstrual cycle; and longer methods, intended for careful research and applicable to small amounts. In the first group comes the Guterman method (1944) and, distinctly preferable, the method of Sommerville, Marrian, and Kellar (1948). In the second group come the method of Sommerville, Gough, and Marrian (1948) and the ingenious technique of Huber (1947) and de Watteville *et al.* (1948), which employs adsorption chromatography with alumina for purifying the pregnanediol.

As can be seen in Fig. 1, the pregnanediol excretion in normal pregnancies shows a slow rise during the first 20 weeks, reaching a level of 20–30 mg. per 24 hours. Thereafter the rise is increasingly rapid, a peak, in the region of 90 mg. being attained about the 37th–38th week. The excretion then drops rapidly, disappearing altogether a few days after delivery. It must be emphasized that variations from this mean curve are considerable even in apparently normal pregnancies, so that the interpretation of isolated determinations may be difficult or impossible.

A number of attempts have been made to use pregnanediol assay as a method of pregnancy diagnosis, since it is obvious that an accurate and relatively simple chemical method would have distinct advantages over biological procedures (Guterman, 1944, 1945; McCormack, 1946; Reinhart and Barnes, 1946; Merivale, 1948; Henderson *et al.*, 1949; Swyer, 1949; de Watteville, 1951; etc.). The reliability of the results has varied markedly in different reports, and a considerable literature has developed, arguing the case for and against. It is unnecessary to enter into the controversy here, but one conclusion is inescapable: the amounts of pregnanediol excreted during the first few weeks of pregnancy—that is, after the period has been missed—may be no different from those during the luteal phase of the normal cycle, so that on these grounds alone the theoretical basis for the test becomes invalid. The exclusion of all cases in which bleeding has occurred after the suspected onset of pregnancy, as Guterman (1945) considers essential, clearly limits the value of the test considerably. It seems fair to state that, although some authors have found the test as reliable as the Friedman test, since many others—for example, Reinhart and Barnes (1946), Merivale (1948), and

Swyer (1949)—have reported very different findings, pregnanediol assay is not to be recommended as a worth-while substitute for the established biological methods of pregnancy diagnosis.

Chorionic Gonadotrophin

The "pregnancy hormone" *par excellence* of the human (though apparently not necessarily of most other species) is chorionic gonadotrophin (C.G.) (also known as "anterior-pituitary-like hormone" and prolan) since it occurs only during pregnancy—if we except certain relatively rare teratoid tumours of so-called chorion epitheliomatous type. Curiously enough, it cannot be said that we are at all certain of its function during pregnancy; and there is no doubt that its peculiar curve of production (Fig. 1) remains unexplained. It is the substance responsible for the reactions which provide the basis of biological pregnancy diagnosis tests, causing ovulation in immature mice (Aschheim–Zondek test), in mature rabbits (Friedman test), and in the South African clawed toad (*Xenopus laevis*); and causing the appearance of spermatozoa in the cloacal urine of the male South American toad (*Bufo arenarum* Hensel) and in the North American leopard frog (*Rana pipiens*). Probably the most satisfactory quantitative method for its assay is that developed by Loraine (1950) employing the weight of the immature rat's prostate.

C.G. first appears as soon as the fertilized ovum has become embedded, and is believed to be formed by the trophoblast. It has been detected as early as the 25th day after the beginning of the previous period (based on a 28-day cycle) and therefore before the next period has been "missed." Its excretion in the urine rises rapidly, reaching values between 20,000 and 40,000 i.u./24 hours between the 40th and 80th days of pregnancy. By the 100th day the peak period is over and a relatively steady level is maintained until the end of pregnancy. Loraine regards the normal range for this level as between 4,000 and 11,000 i.u./24 hours. A slight but apparently significant rise occurs about the 37th week of pregnancy, and after parturition the hormone rapidly disappears from the urine, none usually being detectable by the fourth day after delivery.

Some simple arithmetic applied to these values gives interesting results. It is probable that 15 i.u. or more of C.G. is required to produce ovulation in the rabbit—that is, to give a positive Friedman test—and, since 10 ml. of urine is usually injected, it follows that not less than 1.5 i.u./ml. must be present. Assuming the first morning specimen to have twice the concentration of the total 24-hour specimen, and assuming a 24-hour volume of 1,500 ml., this implies that, in general, the 24-hour excretion must exceed 1,125 i.u. in order that a positive Friedman test may be obtained—and, clearly, this value will usually be greatly exceeded. But it is easy to see how this lower limit may occasionally have to be raised three to four times in order that a positive result may be obtained, thus accounting for the occasional false negative tests early in pregnancy—especially before the sixth week—and later on after the peak has been passed. Similar calculations applied to the peak period show that a positive result at 1:10 dilution—that is, with 1 ml. of urine—will generally be obtained, and occasionally the result may be positive at 1:100 dilution—that is, with 0.1 ml. of urine. Between the 40th and 80th days, therefore, a positive Friedman test at 1:100 dilution may be physiological and not indicative of hydatidiform mole.

The distribution of C.G. in mother and foetus has been studied by Bruner (1951), who found the concentration always to be highest in the chorionic placenta, thus supporting the view that the hormone originates in the trophoblast. In the mother, the highest concentration was found in the blood, the endometrium coming next and being richer in the hormone than any other tissue. The concentration in the foetus is very low, being about 1/10 to 1/20 that in maternal muscle; nevertheless it was thought that the total amount of C.G. reaching the foetus might be of physiological significance. Evidently, therefore, the hormone is released by the chorion into the maternal blood stream, from which a small amount passes the "placental barrier" to enter the foetal blood stream.

Anterior-pituitary Hormones

The substances of potential interest under this heading are prolactin, growth hormone, adrenocorticotrophic hormone and thyrotrophic hormone. No simple methods for the assay of any of these are available and knowledge of their behaviour during pregnancy is slight. The fact that the pituitary enlarges during pregnancy has led many to suppose that it becomes more active at that time. Direct evidence supporting this view is very scanty. Prolactin is probably produced in small amounts during pregnancy, but apparently (Lyons and Page, 1935; Meites and Turner, 1941) in considerably larger amounts *post partum* (not altogether confirmed by Coppedge and Segaloff, 1951). The possibility of increased growth hormone production during pregnancy, particularly in the diabetic and pre-diabetic woman, and of its implication in the foetal complications in those conditions (Barns and Morgans, 1948; Gilbert, 1949; Barns *et al.*, 1950), is an interesting speculation not yet susceptible of proof. Recent investigations seem to indicate an increased production of A.C.T.H. during pregnancy (Parrott, unpublished); the increased secretion of some adrenocortical steroids (see below) certainly suggests the probability of such an augmentation. Swelling and hyperplasia are often observed in the thyroid gland during pregnancy and suggest increased thyrotrophic hormone production, but no accurate studies have lent support to this view.

Thyroid Hormone

It is now usual to regard the serum precipitable (or protein-bound) iodine (S.P.I.) as giving a measure of the amount of thyroid hormone present in the blood. In normal non-pregnant women this value varies between 4 and 8 μg. per 100 ml. of serum. Peters *et al.* (1948) found that from the second month the level rose to a mean of 8.3 μg., the range being 6.2 to 11.2 μg. They observed that this rise in S.P.I. occurred much earlier in pregnancy than that in the B.M.R., which begins only after the fourth month.

Adrenocortical Hormones

Venning (1946) has studied the output of adrenal steroids during pregnancy and has shown that the glycogenic corticoids—that is, those able to cause deposition of glycogen in the livers of adrenalectomized mice—increase in a complex fashion (Fig. 2). There is a rise to about twice the normal value, coinciding with the gonadotrophin peak, followed by a fall, with a subsequent rise to about four times the normal value during the third trimester. Using chemical methods, other workers (Heard *et al.*, 1946; Tobian 1949) have shown similar rises in the neutral lipoid-soluble reducing fractions of the urine during pregnancy, though the increases are less than those found by the biological method. There is as yet no means of separately estimating the so-called glucocorticoids and the mineralocorticoids; indeed, the validity of such a differentiation is doubted by some. It should also be remembered that there is an increasing awareness of the defects and limitations of all hitherto proposed methods for determining the excretion of adrenocortical metabolites (cf. Marrian, 1951).

By contrast, the 17-ketosteroids (representing roughly the "androgenic" activity of the adrenal cortex), when measured by the Pincus reaction (which uses antimony trichloride), shows practically no change throughout pregnancy. On the other hand, with the Zimmerman reaction (using *m*-dinitrobenzene in alcoholic potassium hydroxide), a progressive rise is found during the second half of pregnancy. Now the Zimmerman reaction is also given by 20-ketosteroids (such as pregnanolones), so that

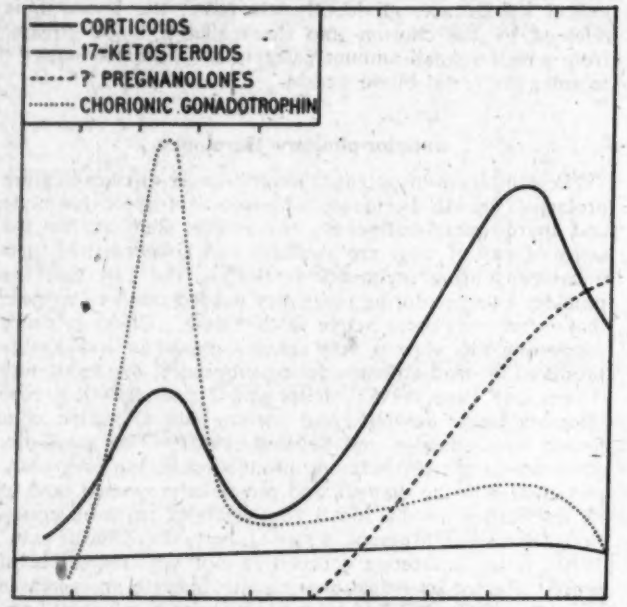


FIG. 2.—The urinary excretion throughout normal pregnancy of "corticoids," 17-ketosteroids, and the suggested excretion of pregnanolones

Venning (1946) has suggested that this discrepancy between the two methods might be due to the excretion of increasing amounts of pregnanolones, and, since these give only about one-eighth the colour of 17-ketosteroids in the test, it would follow that their excretion would apparently rise to something like 80 mg. per 24 hours at full term (Fig. 2).

If the increased secretion of corticoids—that is, compounds related to corticosterone—during pregnancy is due to increased stimulation by A.C.T.H., it must be concluded that the activity of the adrenal cortex is modified during pregnancy, since in the non-pregnant state the typical response of the adrenal to A.C.T.H. involves the 17-ketosteroids as well as the corticoids (the latter, however, to the greater extent).

Posterior Pituitary Hormones—Pitocinase

There have been no convincing studies of the production of posterior-lobe principles during pregnancy. Page (1947), however, has shown that there is a remarkable increase in the pitocinase activity of plasma during pregnancy, the level near term being several thousand times that at conception. Indeed, during the first 16 weeks of pregnancy the increase in activity follows a linear function and can be made the basis of a test for determining the duration of pregnancy. Though the significance of this enzyme is still far from clear, it would seem that its increased production serves to prevent the stimulating action of "pitocin" on the uterus, and its sudden disappearance at term would have an obvious association with the onset of labour.

Serum Histaminase.—Another enzyme characteristic of pregnancy is histaminase, which arises in the placenta and appears in the plasma only during gestation. Numerous methods for its assay, some chemical, some biological, have been proposed from time to time, but hitherto all have had their drawbacks. A very recent method described by Kapeller-Adler (1951) seems much more promising and has the great advantage of simplicity. It depends upon the fact that during the action of histaminase on histamine in the presence of indigo carmine one molecule of H_2O_2 is formed for each molecule of histamine oxidized, so that the amount of unoxidized indigo can be estimated by titration with $KMnO_4$, thereby giving a measure of the histaminase activity.

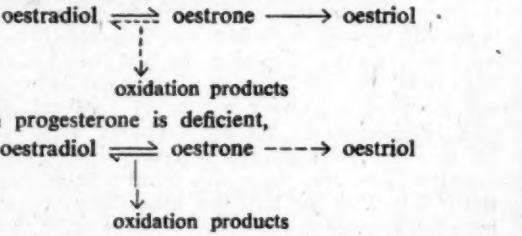
The histaminase content of the plasma bears a close relationship to the functional capacity of the placenta and shows a sharp rise from about the 14th week of pregnancy, reaching a peak value near the 26th week which is about eight times that found before the 14th week. Thereafter it falls slowly until term, disappearing altogether within four to five days of parturition.

Hormonal Findings in Abnormal Pregnancies

Toxaemia of Pregnancy

Since this condition (the "disease of theories") is one of the two outstanding unsolved problems of obstetrics (the other being uterine inertia), it deserves consideration first. A very able review of the subject has been given by Smith and Smith (1948), who summarize the findings as follows: in eclamptogenic toxaemia there appears to be (1) excessive antidiuretic substance in the urine and placenta; (2) a melanophore-expanding principle (perhaps from the intermediate lobe of the pituitary gland) in the blood and placenta; (3) a hypersensitivity to the injection of posterior pituitary secretions (this probably indicates deficient production of pitocinase); (4) high titres of C.G. in a large percentage of cases; (5) decreased excretion of oestrogens and pregnanediol; and (6) histological and histochemical changes in the placenta similar to but more marked than those of the normal placenta at term and primarily involving degeneration of the syncytial cells which probably secrete the steroid hormones.

Some further comment in relation to the oestrogens in toxaemia is pertinent. The Smiths, impressed by the apparent reciprocal relationships of oestrogens and C.G., believe that the latter is utilized by the placenta for the production of oestrogen and progesterone. In many cases of toxaemia they observed a rise in C.G. coinciding with a fall in oestrogen and pregnanediol excretion. This they have interpreted as being due to failing utilization of C.G. because of degeneration of the syncytial cells. In those cases of toxaemia in which C.G. was found to be present in normal amounts they further postulate decreased production of C.G. as a secondary result of placental damage. Their studies of the excreted oestrogen fractions and oxidation products have led to the formulation of a scheme of oestrogen metabolism in which progesterone facilitates the conversion of oestradiol to oestrone, which is then further transformed to oestriol as follows:



but when progesterone is deficient,

They believe that the oxidation products stimulate the production of oestrogen and progesterone through the increased utilization of C.G.; and, further, that stilboestrol behaves in this respect like the oxidation products in causing a fall in serum C.G. and an increase in pregnanediol excretion in pregnant women. The fall in serum C.G. has been confirmed by Loraine (1949), who has shown, however, that it is transient, the C.G. level rising again even though stilboestrol administration be continued. The increased excretion of pregnanediol has not been confirmed. Indeed, Sommerville, Marrian, and Clayton (1949) have found that stilboestrol regularly *decreases* the excretion of pregnanediol, which rises to the normal level again on stopping the stilboestrol. These authors suggest that the Smiths' findings on pregnanediol excretion might be explained by the fact that, having used the Venning method which determines sodium pregnanediol glucuronidate, they would probably also be measuring at the same time some conjugated excretory product of stilboestrol. The Smiths are not satisfied with this explanation, and the controversy still is unsettled.

Some older observations—for example, those of Fauvet and Münzner (1937)—seemed to indicate decreased adrenocortical activity in toxaemia of pregnancy, but more recent studies point in the direction of increased activity, particularly with respect to the corticoids. Thus Tobian (1949) found that whereas during the last trimester in normal pregnancies twice as much corticoid is excreted as by non-pregnant women, a still higher corticoid excretion was seen in women with excessive oedema (46% more, which is statistically significant). Twin pregnancies were also associated with increased corticoids. There was no correlation between the elevation of the blood pressure in toxaemia and the corticoid excretion, but in essential hypertension in pregnancy no abnormal changes in the corticoids were seen. In addition to the rise in corticoid excretion, Devis and Eeckhoudt (1949) claim to have found abnormally low 17-ketosteroid outputs and seek to ascribe to this alleged hormonal imbalance an aetiological role in toxaemia of pregnancy. It seems fair, however, to point out that the hormonal findings might just as well represent the reaction of the adrenal cortex to the stress imposed by the disease. There is general agreement that the histaminase content of the plasma is significantly reduced in toxaemia of pregnancy, the degree of reduction being related to the disturbance in functional capacity of the placenta. The new simple method of Kapeller-Adler already mentioned may prove to be of real clinical value in helping the obstetrician to decide when, because of the failing placenta, the pregnancy should be terminated to avoid intrauterine death of the foetus.

In *hyperemesis gravidarum* there is reason to believe that C.G. levels are sometimes abnormally high. A plausible explanation of the condition is that it represents a hypersensitivity response to what is essentially a foreign protein. Clearly, therefore, excess of C.G. is not indispensable for the production of the condition, and such an excess is not always found.

Hydatidiform mole, on the other hand, is almost invariably accompanied by a greatly increased output of C.G., so that usually as little as 0.1 ml. of urine will give a positive Friedman test—that is, 1:100 dilution. A similar positive response (though usually in a lower dilution) can be obtained with cerebrospinal fluid. It has already been pointed out that, at the peak of C.G. excretion—that is, about the 60th–70th day of pregnancy—positive Friedman tests are sometimes obtained at similar dilutions in normal pregnancies, and particularly in multiple pregnancies. It is therefore easy to be misled by such a finding, at about the 10th week, if there is some vaginal bleeding together with a twin pregnancy—so that the uterus would seem larger than the expected size. The fact that pregnanediol excretion has been reported as zero in hydatidiform mole (Guterman, 1945; McCormack, 1946; Swyer, 1949) engendered the hope that its measurement might help to disentangle such a problem, but there is now no doubt that the absence of pregnanediol in cases of hydatidiform mole is not invariable, and its assay will not therefore serve as a differential test in these cases (Bender, quoted by Swyer, 1949; de Watteville, 1951).

In *chorion epithelioma* the output of C.G. increases to still higher levels, the daily excretion reaching the order of millions of international units.

Abortion

It was claimed by Guterman (1946) that by the use of his semiquantitative test for pregnanediol the fate of cases of threatened abortion was correctly predicted in 93% of 73 cases, a "positive" test being correlated with continuation of the pregnancy. Other workers have not found so close a correlation, though there is no doubt that the mean excretion for those cases in which the pregnancy continues is significantly higher than in those in which abortion occurs (Swyer, 1949; de Watteville, 1951). It is, of course, clear that some patients will abort even though the pregnanediol excretion is normal, because some cause other than progesterone deficiency is operating. Bender (1948) has produced evidence that, by using the Guterman test to differentiate cases of threatened abortion with high pregnanediol excretion from those with low outputs, and reserving treatment with progesterone for the latter only, a statistically significant increase in the salvage rate can be obtained; on the other hand, progesterone given to patients with threatened abortion but with positive Guterman tests increased the likelihood of abortion.

The pregnanediol excretion in the early months of pregnancy in patients who have had two or more consecutive early abortions does not differ significantly from randomly selected antenatal patients at comparable stages of pregnancy (Swyer, unpublished observations). This evidence therefore does not lend support to the view that deficiency of progesterone may be a cause of so-called habitual abortion. Further discussion of this problem would be out of place here.

The serum histaminase level is usually low in threatened abortion (Kapeller-Adler, 1951). It seems that the serum precipitable iodine may also be low in threatened abortion; thus Peters, Man, and Heinemann (1948) found that in 8 of 12 S.P.I. determinations in such cases the value was less than 6.2 μg., the lowest amount found in normal pregnancy. None of these patients, it should be noted, showed any stigmata of hypothyroidism.

In *incomplete abortion* it is not uncommon to find fluctuating pregnanediol levels in serial determinations, while pregnancy diagnosis tests depending upon the detection of C.G., such as the Friedman test, may give irregularly positive and negative results. This is due to the survival of portions of placenta. In *missed abortion*, however, where placental separation is usually complete, consistently negative results are the rule.

In *multiple pregnancy* the excretion of C.G. and the serum histaminase levels are usually high, but these estimations are not of diagnostic value.

The diagnosis of *ectopic pregnancy* is often difficult, and assistance is usually sought from a pregnancy diagnosis test. The value of a rapid test, especially in cases of suspected ruptured ectopic pregnancy, needs no comment. In practice, however, all tests may prove misleading because the abnormal implantation usually results in a deficient production both of C.G. and of progesterone. Consequently, the Friedman and Aschheim–Zondek tests may be negative and the pregnanediol excretion too low to allow of the confident diagnosis of pregnancy.

So far as other commonly encountered complications of pregnancy are concerned, studies of the hormone levels have not been sufficient to permit any generalizations. It is obvious, therefore, that much work on this subject remains to be done, and the time is still a long way off when the clinical pathologist, working in a routine laboratory, can hope to be able to give the perplexed obstetrician much assistance by means of hormone assays.

Summary

The list of hormones of actual or potential interest in pregnancy is a formidable one, and assay methods for several of them are still imperfect. In normal pregnancies the oestriol fraction and, to a lesser extent, the oestrone and oestradiol fractions show marked increases during the last two trimesters, but fall rapidly during the last fortnight; progesterone production, as judged by pregnanediol excretion, follows a somewhat similar pattern; chorionic gonadotrophin secretion begins as soon as implantation of the ovum has been established, rises to a striking peak between the 60th and 80th days, and then falls to a more or less steady level; complex changes occur in the adrenocortical metabolites, the precise nature and significance of which are but little understood; ill-defined and uncertain changes occur in the

various pituitary hormones; and the histaminase and pitocinase contents of the plasma rise in characteristic fashions.

In abnormal pregnancies comparatively few hormone studies have been made except in toxaemia and abortion. In the former it seems that most, but not all, cases show an increase in chorionic gonadotrophin and a decrease in oestrogens and pregnanediol; probably the adrenal corticoids are also increased, though the 17-ketosteroids are decreased. In threatened abortion there is usually, but certainly not always, a low pregnanediol excretion and a low serum precipitable iodine (representing circulating thyroid hormone) and histaminase content. The chorionic gonadotrophin is greatly increased in hydatidiform mole and in chorion epithelioma. Less well-defined hormone changes may be found in various other abnormalities of pregnancy.

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The international conference on blood transfusion, recently held at the British Standards Institution in London, reached agreement on several fundamental proposals, the objectives of which are to get standardization and interchangeability of the equipment involved both in obtaining blood from donors and in giving transfusion to patients. Among the proposals agreed, and which it is expected will be the subject of International Organization for Standardization recommendations for national standards, are such important items as: overall sizes of glass containers, including sizes of the necks of the bottles; properties to be possessed by the stoppers of the bottles; the dimensions of the mounts for flexible tubing and piercing-needles; identification of the piercing positions in the stoppers separately for collecting and for transfusion of blood; minimum rate of filter and drip chamber flow. Items for future study include: standard sizes of the most used bottle; type of mount for hypodermic needle; simple label identification of the blood group of the contents of the bottle, and performance standards for the glass bottles.

CHANGES IN BASAL METABOLISM, SERUM-PROTEIN-BOUND IODINE, AND CHOLESTEROL DURING TREATMENT OF HYPOTHYROIDISM WITH ORAL THYROID AND L-THYROXINE SODIUM

BY

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It has been generally established that in patients with untreated hypothyroidism the serum-protein-bound iodine (P.B.I.) is consistently below the normal range of 4 to 8 μg. per 100 ml., and the literature has been reviewed by Rapport and Curtis (1950). Further, Winkler, Riggs, and Man (1945) claimed that serum iodine is not only a valuable aid in the diagnosis of hypothyroidism but a useful criterion of the adequacy of treatment with thyroid substance, for its return to within the normal range with adequate treatment is a better indication of the thyroid status of the patient than the basal metabolic rate (B.M.R.), the latter becoming stabilized at a slower rate than the serum iodine.

In support of this statement Winkler *et al.* described their findings, first, in a case of post-operative hypothyroidism, after thyroidectomy for thyrotoxicosis: "Forty days after operation the serum iodine had already fallen to 1 μg. per 100 ml., yet the metabolic rate was still + 3%; and, secondly, their observations in controlled hypothyroidism after withholding thyroid: "Indeed, in the entire series of patients at the time of the initial iodine determination, metabolic rates as low as −30% or less need not appear unless the patient had remained untreated for several years." They also quoted the case of a patient with hypothyroidism whose initial (untreated) B.M.R. was −34, and who after more than a year of adequate thyroid therapy maintained a normal B.M.R. of −6, despite a period of over eight months without thyroid, and a serum iodine of 2.6 μg. per 100 ml. It has also been stated that the latter is less subject than the B.M.R. to fluctuations in serial determination (Riggs, 1947). Hypercholesterolaemia is usually another characteristic feature of hypothyroidism, but it is not apparently an obligatory accompaniment (Winkler, Riggs, and Man, 1945).

The treatment of hypothyroidism with synthetic thyroxine has been described by Hart and Maclagan (1950), who conclude that L-thyroxine sodium is as satisfactory for the purpose as thyroid extract, and suggest that it has an advantage in reliability in that it is a synthetic substance and requires no biological or chemical standardization.

In order to compare the results of treatment of hypothyroidism with L-thyroxine sodium and with whole dried thyroid we have made serial examinations of five established cases. The patients voluntarily agreed to stop treatment for a period of some two months, after

which time the B.M.R., P.B.I., and serum cholesterol were determined while these substances were given for alternating periods.

Methods

The B.M.R. was measured by the closed-circuit method, evidence of the accuracy of which was given by Robertson (1937). The apparatus used was the Benedict–Roth with recording kymograph. All machines were alcohol-checked (Barrett and Robertson, 1937) and found to be accurate; in addition each was checked once a week by a model whose B.M.R. was in the region of 54 calories an hour. The standard technique used in measuring the B.M.R. has been described by Robertson (1944). The subjects attended on at least two successive mornings, and were seen personally by one of us. If on the second day the duplicates agreed within 5% (and were not higher than the first-day readings) the lower reading was taken as the B.M.R. On the other hand, if the duplicate readings were not within 5%, or the second-day readings were higher than those on the first day, then readings were taken on subsequent days until a constant reading was obtained.

In the present series, excluding the initial readings, basal rates were obtained in two days. As the technique for measuring the basal metabolism varies in different laboratories (DuBois, 1936), it is important, particularly when comparing the B.M.R. with the serum iodine, to describe precisely the technique employed and the chemical procedure adopted in estimating the blood iodine. The P.B.I. was determined by the method of Barker (1948) as modified by Barker and Lipner (1949), with some modifications which will be discussed elsewhere (Kirkpatrick—unpublished).

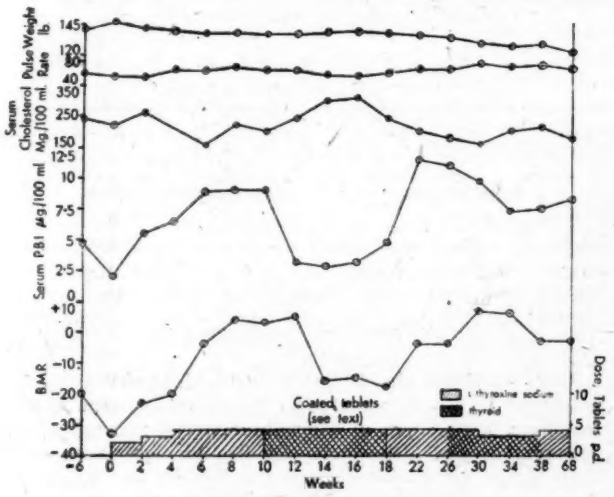

FIG. 1.—Observations on Case 1.

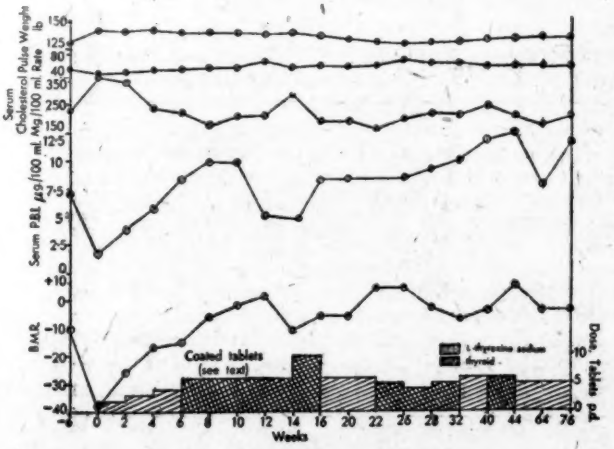

FIG. 2.—Observations on Case 2.

Cholesterol was estimated by the method of Sackett (1925). Medication was given orally in the form of tablets—L-thyroxine sodium (Glaxo), 0.1 mg., or thyroid *B.P.*, 1 gr. (65 mg.) (Armour)—also gelatin-coated tablets of a thyroid preparation stated to be of *B.P.* specification.

Results

The detailed results of our investigations are conveniently shown in Figs. 1–5. In each case, after a period on L-thyroxine sodium with increasing dosage, thyroid was substituted in the form of gelatin-coated tablets. The net result was a general return to a near myxoedematous condition regardless of dose. Upon investigating the disintegration characteristics of these tablets it was found that only a small indefinite proportion disintegrated at all under physiological conditions, and the results have been disregarded except in the qualitative sense of confirming a lag in the response of the B.M.R. to a change of thyroid status, and in disclosing the hazard of using tablets not of *B.P.* specification.

The following changes have been noted from a study of the charts.

P.B.I.—A rapid rise occurs at the initiation of treatment, and the level rises or falls with variations in dosage, being stabilized within two weeks on a fixed dose irrespective of whether thyroxine or thyroid is being administered. Cessation of treatment in each case reduced the level of the P.B.I. to well below the range of our normal controls—namely, 3.6 to 8.6 µg. per 100 ml.

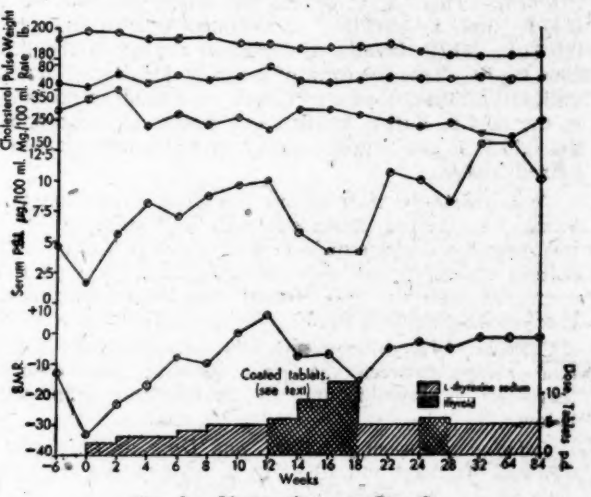

FIG. 3.—Observations on Case 3.

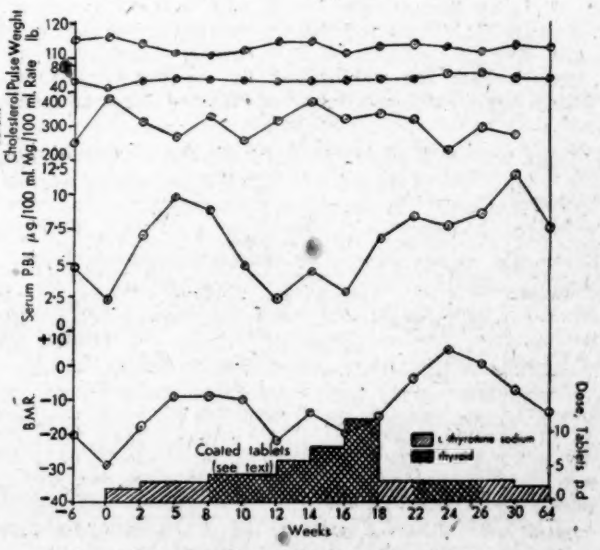

FIG. 4.—Observations on Case 4.

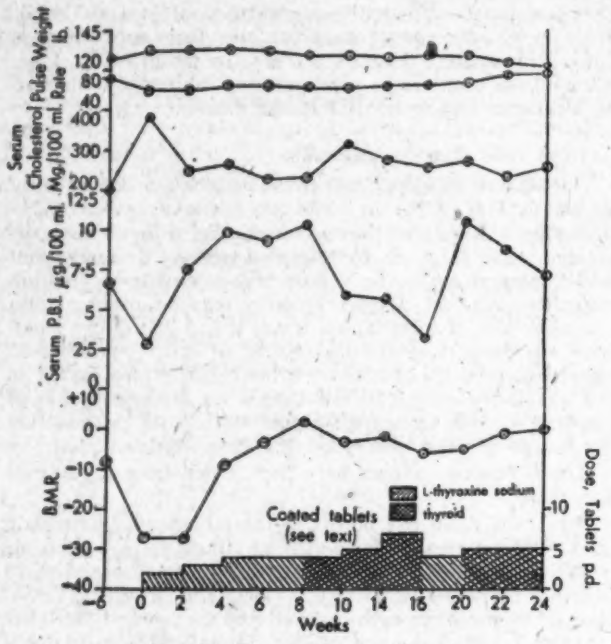

FIG. 5.—Observations on Case 5.

B.M.R.—There is a distinct lag in the response of the B.M.R. both to initiation of treatment and to changes in the latter which involve a significant change in the P.B.I. This lag may take the form of a steady decrease or increase until stabilization occurs, or it may even result in no change in the B.M.R. during the first two weeks. Stabilization of the B.M.R. is not complete until four weeks have elapsed on a fixed dosage.

Cholesterol.—In each of our five cases hypercholesterolaemia was present coincident with myxoedema. During treatment the cholesterol level gave a fair indication of the thyroid status, though the changes incline to sluggishness compared with the P.B.I., and some rather inexplicable changes seem liable to occur.

Calculations from our results have been made of the direct relationships between the P.B.I., B.M.R., and doses of thyroxine or thyroid, and the findings are summarized below.

Relation Between the P.B.I. and Dose of Thyroxine or Thyroid (Tables I and II).—The calculation has been made by dividing the observed rise in P.B.I. in µg. per 100 ml. from the basic untreated level by the dose.

Relation Between the B.M.R. and Dose of Thyroxine or Thyroid (Tables III and IV).—In correlating the B.M.R. with the dose of medicant, it is obviously necessary to allow enough time for stabilization of the former. We have accordingly employed only those figures that were obtained after four weeks at the set dosage. Calculation was made by dividing the rise from the basic untreated level by the dose.

Relation Between the P.B.I. and B.M.R. (Table V).—This relationship was calculated by dividing the rise in B.M.R. from the untreated basic level to a stabilized value by the corresponding rise in P.B.I. from the untreated basic level.

TABLE I.—*Rise in P.B.I. (µg. per 100 ml.) per 0.1 mg. L-thyroxine Sodium*

Patient	1	2	3	4	5
Individual mean	1·7	1·4	2·1	2·4	2·2

Mean of all results = 1·9. Standard deviation, ±0·30.

TABLE II.—*Rise in P.B.I. (µg. per 100 ml.) per 1 gr. (65 mg.) Thyroid*

Patient	1	2	3	4	5
Individual mean	2·1	1·7	1·1	1·6	1·3

Mean of all results = 1·7. Standard deviation, ±0·58.

TABLE III.—*Rise in B.M.R. (%) per 0.1 mg. L-thyroxine Sodium*

Patient	1	2	3	4	5
Individual mean	9	7	7	6	7

Mean of all results = 7. Standard deviation, ±1·2.

TABLE IV.—*Rise in B.M.R. (%) per 1 gr. (65 mg.) Thyroid*

Patient	1	2	3	4	5
Individual mean	13	8	5	9	6

Mean of all results = 9. Standard deviation, ±3·2.

TABLE V.—*Rise in B.M.R. % per 1 µg. % Rise in P.B.I.*

(*a*) *Treatment with L-thyroxine Sodium*

Patient	1	2	3	4	5
Individual mean	5·0	4·7	4·2	3·5	3·9

Mean of all results = 4·4. Standard deviation, ±0·55.

(*b*) *Treatment with Thyroid*

Patient	1	2	3	4	5
Individual mean	5·4	4·3	4·8	5·2	4·5

Mean of all results = 5·0. Standard deviation, ±0·77.

Table VI shows the decline in the B.M.R. after treatment with thyroid was discontinued. Symptoms of hypothyroidism were complained of after three weeks and signs were apparent by the fifth week. By five to eight weeks after thyroid had been discontinued the B.M.R. had practically fallen to the initial level when the patient was first seen and before any treatment had been instituted. The serum iodine also decreased after thyroid had been stopped.

TABLE VI.—*Fall in B.M.R. and P.B.I. After Omitting Thyroid for Five to Eight Weeks in Established and Treated Cases of Myxoedema. Basal Metabolism: Normal Range 0 to −20 (Standards of Aub and DuBois)*

Patient	Untreated Initial Observations			Present Investigations									Present Maintenance Dosage of Thyroid and Thyroxine					
				Adequately Treated with Thyroid					After Thyroid Omitted									
	Date	B.M.R.	Cholesterol mg./100 ml.	Thyroid gr. per Day	Years on Thyroid	B.M.R.	P.B.I. µg./100 ml.	Cholesterol mg./100 ml.	Days off Thyroid	B.M.R.	P.B.I. µg./100 ml.	Cholesterol mg./100 ml.	Thyroid gr. per Day	Thyroxine mg. per Day	B.M.R.	P.B.I. µg./100 ml.	Cholesterol mg./100 ml.	Age
1	1941	−29	325	2	9	−16	4·8	246	21 33	−25 −33	2·0	220	3	0·3	−3	8·3	165	62
2	1942	−40	265	4	9	−10	7·1	230	41	−38	1·7	350	5	0·5	−4	11·5	170	49
3	1942	−37	535	6	8	−13	4·5	286	36	−33	1·6	318	6	0·5	−2	10·0	180	51
4	1936	−28	330	1	14	−20	4·7	240	42 58	−24 −29	3·6 2·3	255 382	2	0·2	−12	7·4	220	63
5	1942	−30	415	3	8	−9	6·6	196	21 35	−24 −27	2·8	380	5	0·4	−1	6·4	232	66
Mean		−33	374			−18	5·5	239		−32	2·1	330			−4	8·3	193	

Discussion

When thyroid was withheld from cases of hypothyroidism the B.M.R. fell and in five to eight weeks reached the low level found before treatment. There was a parallel fall in the serum iodine over the same period. These observations do not agree with those reported by Winkler, Riggs, and Man (1945), who stated that the decrease in serum iodine "may take place weeks or months before there is any marked change in the basal metabolism." The decline in the B.M.R. to an athyreotic level, as we have reported after withholding thyroid for five to eight weeks in cases of treated hypothyroidism, would be expected from the work of Boothby and his co-workers (1924, 1925) on the calorigenic properties of a single injection of thyroxine in cases of hypothyroidism, when they found that the thyroxine was destroyed or eliminated in about fifty days.

Some confusion may be caused by the following statement in Winkler, Riggs, and Man's paper (1945): "In the entire series of patients at the time of the initial iodine determinations metabolic rates of −30 or lower need not appear for several years." By analogy this might be understood to imply that these authors regarded a B.M.R. of at least −30 as a prerequisite for the diagnosis of untreated hypothyroidism. In thyrotoxicosis there is no absolute basal rate figure for confirming the diagnosis because, although the B.M.R. may be well above +50 in severe cases, in mild cases it may lie within the normal range (Robertson, 1934), and such findings in reverse could equally well apply to cases of hypothyroidism. Means (1948) has stated that in complete athyreosis the B.M.R. runs very constantly in most cases between −35 and −45, and here the clear-cut picture of myxoedema is present; but in lesser degrees of hypothyroidism correspondingly higher basal rates will be obtained, and these may even border on the lower limits of the normal range.

The specific action of iodine on the B.M.R. in thyrotoxicosis has been employed as a delicate and exact diagnostic aid in that condition when the degree of toxicity is mild and clinically the picture is difficult to assess (Means, 1933; Robertson, 1934); and Robertson (1949) has suggested that the effect of thyroid, 2 gr. (130 mg.) daily, on the B.M.R. was of equal use in diagnosing mild hypothyroidism. To fix a B.M.R. of −35 with an average of about −40 (Means, 1948) as an arbitrary limit above which clear-cut myxoedema or complete athyreosis can be ruled out is now generally accepted, but rates higher than this need not exclude milder degrees of hypothyroidism. In addition to this being a personal experience, a study of Winkler, Riggs, and Man's cases (1945) shows that 13 out of 18 untreated cases of hypothyroidism had an initial B.M.R. higher than −35, and three were as high as −18 to −19. It is difficult to explain, as described by the above authors, a B.M.R. of −6 after stopping thyroid, 1½ gr. (100 mg.), for over eight months in a case with an initial B.M.R. of −34. No such phenomenon has been noted in a series of 16 cases of established myxoedema with a mean initial B.M.R. of −40 (range −34 to −47). In all cases the B.M.R. fell from normal to the initial level within two months of stopping thyroid (Robertson, unpublished results).

Our general observations on the changes in the B.M.R. and P.B.I. during treatment of hypothyroidism are in substantial agreement with those of Winkler, Riggs, and Man (1945), in that there is a rapid stabilization of the P.B.I. during treatment compared with a lag in the response of the B.M.R. Our calculations correlating the changes in the B.M.R. with those in the P.B.I., and the changes in the P.B.I. and B.M.R. with the dose of thyroxine or thyroid, have been confined to the simplest terms, but the inferences to be drawn from the results appear to us to be quite clear-cut. Tables I and II indicate that the variation in the response of the P.B.I. to thyroid is twice as great as that to L-thyroxine sodium. Tables III and IV show the response of the B.M.R. to thyroid to be about two and a half times as variable as that to L-thyroxine sodium. In contrast to these observations Table V shows that correlation of the B.M.R. with P.B.I. is of the same order irrespective of whether thyroid or L-thyroxine is administered. It therefore seems obvious that a large part of the variation encountered in the use of thyroid for the control of hypothyroidism can be attributed to deviations in the biological potency of the thyroid, and that this particular variation can be avoided by administration of L-thyroxine sodium.

The lag in the B.M.R. behind the P.B.I. led Winkler, Riggs, and Man (1945) to state that fluctuation in P.B.I. in hypothyroidism was a more useful criterion than the B.M.R. of the adequacy of treatment with thyroid. Our results do not support this view. Next to the clinical picture we feel that the B.M.R. gives a better index of the patient's thyroid requirements than the P.B.I., for on several occasions during thyroid and thyroxine medication the P.B.I. reached levels commonly found in thyrotoxicosis (above 8 μg. per 100 ml.) when in fact clinically there was no evidence of overdosage and the B.M.R. was within the normal range.

Summary and Conclusions

Five cases of hypothyroidism have been treated orally with L-thyroxine sodium and two brands of thyroid over periods of six to eighteen months.

Clinically, L-thyroxine sodium is as satisfactory as thyroid gland in the treatment of hypothyroidism.

Relationships between the B.M.R., serum iodine, and doses of thyroid and L-thyroxine sodium observed during treatment of five cases of hypothyroidism indicate a less variable response to thyroxine than to thyroid. Treatment with L-thyroxine sodium results in an average rise of 1.9 μg. per 100 ml. in the protein-bound iodine (P.B.I.) and 7% in the B.M.R. per 0.1-mg. dose.

Stabilization of the P.B.I. occurs more rapidly than that of the B.M.R. during treatment with either L-thyroxine sodium or thyroid. Next to the clinical picture the B.M.R. gives a better index of the patient's thyroid or thyroxine requirements than the P.B.I., for on several occasions during therapy the P.B.I. reached levels commonly found in thyrotoxicosis (above 8 μg. per 100 ml.) when clinically there was no evidence of overdosage and the B.M.R. was within the normal range. The P.B.I. tended to reach higher values with thyroxine than with equivalent doses of thyroid.

Our results, although on a small series of patients, do not support the statement of Means (1948) that the maintenance ration of thyroid is remarkably similar from patient to patient. In our series, dosages of from 0.2 to 0.5 mg. of thyroxine daily, or approximately 2 to 5 gr. (130 to 325 mg.) of thyroid daily, were required to keep the patients symptom-free.

Winkler, Riggs, and Man's statement (1945) that patients are unable to tolerate more than 3 gr. (200 mg.) of thyroid daily without developing symptoms of overdosage is also not supported. The restoration of a P.B.I. to a normal level of 6 μg. per 100 ml. as suggested by these authors was found to be no guide to assessing the maintenance dose of thyroid; for, in our series, patients were symptom-free and without any evidence of thyroid excess at P.B.I. levels all in excess of 6 μg. per 100 ml.

Some disparity in the results can no doubt be attributed to the different methods of standardizing thyroid *B.P.* and thyroid *U.S.P.* The former is assayed for thyroxine iodine and the latter for total iodine, the standards being 0.1% and 0.2% respectively, so that unless the ratio of thyroxine iodine to total iodine has a constant value of 1:2, there must obviously be a difference in biological activity.

The serum cholesterol affords an approximate indication of thyroid status, but seems liable to unaccountable fluctuations.

It is a pleasure to thank Mr. A. V. Bridgland, Chairman of the Trustees of the London Clinic, for granting facilities for this investigation. The thyroxine derivative used was generously supplied by Glaxo Laboratories Ltd.

ADDENDUM.—Subsequent to the completion and submission for publication of this paper, further proof of one of our conclusions has been rather strikingly afforded. One of the patients (No. 3) was referred to us for re-examination by her local doctor one year after stabilization on L-thyroxine sodium, 0.5 mg. daily, with the opinion that, clinically, she appeared in need of a higher dosage of thyroxine. Our examination showed her B.M.R. to be well within the normal range (−3), whereas her serum P.B.I. was 13.5 μg.%, a distinctly thyrotoxic level. It seems obvious, therefore, that during treatment of hypothyroidism with thyroxine the serum P.B.I. may reach a high level indicative of thyrotoxicosis when no such condition is present clinically, and that a more accurate indication of clinical status is provided by the B.M.R.

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A PERSISTENT URINARY SALMONELLA DUBLIN CARRIER WITH BILHARZIASIS

BY

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Attention has recently been drawn to the prevalence in Egypt of urinary typhoid and paratyphoid carriers (Morton, 1949; Neva, 1949; Walton, 1949; Archer *et al.*, 1950). Their importance to the public health is attested by the fact that at least one large outbreak of typhoid among British Service men in the Suez Canal zone has been attributed to an Egyptian urinary excreter of typhoid bacilli (Anderson and Richards, 1948).

In a collaborative study with Dr. J. Weir, representative in Egypt of the Rockefeller Foundation, 53 native urinary salmonella carriers have been followed up for over a year. The distribution of these carriers by salmonella types, when they were originally detected, was as follows: 28 *Salm. typhi*, 13 *Salm. paratyphi A*, 2 *Salm. paratyphi B*, 9 *Salm. paratyphi C* (or group C), and 1 *Salm. dublin*. Some of the temporary carriers later acquired a urinary or faecal species of salmonellosis different from the original infection.

That the series should contain a carrier who has continued to excrete *Salm. dublin* in his urine for over a year seems worthy of record, because this organism is a common cause of disease in man and animals in many parts of the world, but does not appear to have been isolated in Egypt before. Cattle are apparently the main reservoir of infection and the usual source of the human disease, but the present case indicates that the human carrier may play a more important part in the dissemination of *Salm. dublin* infection than has hitherto been thought.

Case Report

This man, an agricultural labourer aged about 35, was found in a bacteriological survey of the general population of a Nile Delta village, where the urinary enteric carrier rate among men, women, and children was 3% (Miller, 1949). He is physically fit, and his only admitted incapacitating illness was one month's "fever" about 10 years previously. He had been passing blood in his urine for 15 to 20 years, but this did not trouble him and he had never sought treatment for schistosomiasis. His youngest child died of "enteritis" at the age of 1 year, but there was no other history of serious family illness. All of 18 specimens of urine examined at more or less regular intervals from November, 1949, until March, 1951, produced a heavy growth of a non-lactose fermenting organism when plated directly on Difco SS agar.

The Organism.—All isolates were actively motile Gram-negative bacilli which fermented glucose, mannite, and dulcite with the production of gas, and caused no change in lactose, sucrose, or salicin. They produced abundant hydrogen sulphide but were indole- and urea-negative and did not liquefy gelatin. They agglutinated strongly in salmonella O serum of group A, to a lesser extent in sera of groups B and D, and not at all in serum of group C; but formalinized broth cultures failed to agglutinate in any of the enteric group diagnostic H sera available in this laboratory. A culture was sent to Commander L. A. Barnes, of the Naval Medical Research Institute, Bethesda, Maryland, U.S.A., who identified the organism as *Salm. dublin*.

Eggs of *Schistosoma haematobium* were found in 16 of the 18 urine specimens, blood in 15, and macroscopic pus in every one. No salmonella or shigella organisms were cultured from 13 stool specimens examined at approximately monthly intervals.

Ten specimens of the carrier's blood were collected during the course of a year. The clots were cultured by a technique known to give a very high proportion of positive results in cases of enteric fever, but all were sterile. The serum specimens were used for agglutination tests. No H agglutinins for typhoid or paratyphoid A were detected; but low-titre (1:5–1:20) H-specific agglutinins for paratyphoid B and C were present in some of the specimens. The typhoid O titre fluctuated between 1:40 and 1:320, and the Vi titre from traces of agglutination at 1:5 or 1:10 dilutions to full standard agglutination at 1:20. The patient's serum invariably agglutinated formalinized broth cultures of his own organism at dilutions varying from 1:640 to 1:2,560.

Comment

The geographical and zoological distribution of the different salmonella species is of considerable interest and practical importance, because all seem to be potentially pathogenic for man. Although *Salm. dublin* has been isolated from many different animals, it appears to be particularly common in cattle and foxes, being at times the cause of epizootics in their young, with a high mortality leading to serious economic loss. It has been reported as a predominant salmonella type of cattle in Britain, Holland, Finland, Sweden, Australia, South Africa, and South

America; and of foxes in Denmark, Finland, Norway, Holland, and the far west of the United States of America (for references to the literature, see Wilson and Miles, 1946). The apparent absence of this particular salmonella from the extensive eastern and mid-western parts of the United States is quite remarkable (Edwards *et al.*, 1948).

Raw milk from an infected cow is the usual vehicle for human *Salm. dublin* infections, and large outbreaks of food-poisoning from this source have often been reported. Symptoms of the infection vary from a mild gastro-enteritis to a fulminating septicaemia, with a special predilection for fatal meningeal involvement in young children. In Britain *Salm. dublin* has been found more invasive for humans than the other food-poisoning salmonellae (Report of Ministry of Health, 1950). The present carrier had no access to cow's milk, but at the time when he had his bout of fever he was part owner of a water buffalo and customarily drank its milk raw. Since *Salm. enteritidis* (Gaertner) infection of water buffaloes had been described (Wolff, 1930) before this closely related organism was generally differentiated from *Salm. dublin*, they may well be natural hosts, as cattle are, and the patient's febrile episode was perhaps a *Salm. dublin* infection resembling enteric fever, conveyed by buffalo milk, followed by the chronic carrier state. This man's unhygienic family environment emphasizes the possibility that his infant's death at weaning age was due to a *Salm. dublin* infection conveyed from the father.

Chronic human carriers of salmonellae other than typhoid and paratyphoid are relatively uncommon, and those that have been reported were almost invariably faecal. I have failed to find any other chronic human carrier of *Salm. dublin* described in the literature. Ledingham and Arkwright (1912), however, mention two cases of chronic urinary infection with *B. enteritidis* Gaertner, which at that time was indistinguishable from *Salm. dublin*.

ADDENDUM (January 15, 1952).—This man continued to be a profuse urinary excreter of *Salm. dublin* until September, 1951, when he was given 30 g. of chloramphenicol in the course of 10 days. In 100 post-treatment days all of 31 urine and 14 stool specimens have been negative for salmonella organisms, despite uncured urinary bilharziasis.

Grateful acknowledgment is made to Dr. I. Messak, of the Egyptian Public Health Service and Rockefeller Foundation, for invaluable assistance in the collection of specimens and in language interpretation; to J. D. Gilmore, J. E. Samsell, and J. R. Baranski for technical assistance; to Captain J. J. Sapero, U.S.N., Commanding Officer of this Unit, for helpful advice; and to the Medical Director-General of the Navy for permission to publish.

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The Archbishop of Canterbury said at a meeting of the Society for the Promotion of Christian Knowledge in London recently that the rising costs of printing meant that very soon we should become a nation of illiterate people (*Manchester Guardian*, March 7). This was not because we could not read intelligently—though he added that there were not so many who could—but because there would no longer be money left to print anything for people to read. This mounting cost was a real threat to our cultural life.

BALANTIDIASIS IN SOUTH PERSIA*

BY

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Balantidiasis is a rare disease in man, and it is therefore considered that the following 87 cases found in South Persia between April 1 and December 31, 1948, are worth placing on record. The only previous records of balantidiasis in Persia are by Stshensnovitsh (1943) and Selimkhanov (1947).

Local Conditions

The cases occurred among the population of Abadan, an oil refinery town on the island of Abadan, South Persia. This island is situated in the estuary of the Shatt-el-Arab river, at the head of the Persian Gulf, and is some 30 miles (48 km.) long and 5 miles (8 km.) wide at its broadest part. It is a flat desert, with small areas under cultivation. The temperature in winter seldom falls below freezing-point, and the summer shade temperature averages 110–118° F. (43.3–47.8° C.), with usually low humidity. The winter rainfall is about 15 in. (38 cm.). Rain does not fall during the summer.

The population of the town at the time consisted of about 200,000 Persians, 2,000 Indians and Pakistanis, and 5,000 British. About 100,000 of the Persians were either employed in the refinery operated by the Anglo-Iranian Oil Company or were dependants of employees. Much was done by the oil company to control and prevent the spread of disease by providing public lavatories and baths, clean piped water supply, an efficient sewerage system, and collection and disposal of refuse. It was sometimes difficult, however, to persuade the uneducated section of the populace to use these facilities, or to make them realize the value of simple hygiene.

In an effort to reduce the incidence of the dysenteries in Abadan a scheme was instituted on April 1, 1947, by which all artisan employees reporting sick and regarded as cases of dysentery on clinical grounds or from stool examination were admitted to the company's isolation hospital. Any employee found to be a carrier of dysentery was also admitted. This scheme was described by Stewart (1949), and led to the collection of this series.

An excellent account of the pathology, with necropsy reports, and a review of the literature on balantidiasis, is given by Koppisch and Wilking (1947).

Mode of Infection

All patients in this series were Mohammedans. In accordance with their religion they had no contact with pigs, nor did they eat pork. The pig can be excluded as the source of infection. This is in accordance with the conclusion reached by Ostroumov (1947) following examination of pigs and slaughterhouse workers in Soviet Central Asia.

No cysts were found in the stools in the Abadan series, and no source of infection, apart from the human cases, was discovered. Intestinal contents of sheep and cattle killed in the town slaughterhouse were examined, but no balantidia were found. The excreta of goats and samples of river water revealed no balantidia. After this investigation, which ended on December 31, 1948, cases occurred with much less frequency, but all continued to be admitted to hospital for treatment. Dr. I. S. Stewart later informed me in a personal communication that balantidiasis is now rare. A man-to-man transmission of the infection therefore seems to be strongly suggested.

*This paper is condensed from a thesis presented for the M.D. degree of the University of Glasgow, 1950.

Method of Investigation

The geographical location of the patient and any contact with animals over the two years prior to admission to hospital were investigated. Neither of these factors was found to be significant. A history of previous attacks of diarrhoea and of the present attack was taken. A history of previous diarrhoea was found in 65% of cases.

A routine physical examination, inspection of the lower 7 in. (17.8 cm.) of bowel by sigmoidoscopy, macroscopic and microscopical stool examinations, and stool culture were made. Each case was re-examined after six months, and if the stool was positive had further treatment and was followed up.

Clinical Features

Common complaints were diarrhoea, abdominal pain, tenesmus, and the passage of blood and mucus. In uncomplicated cases the symptoms in general were mild, though 22% had severe pain and diarrhoea with much blood and mucus. Seven cases which had concomitant bacillary dysentery and one with concomitant amoebic dysentery had severe symptoms.

Small discrete ulcers were found in the lower bowel in 11 cases. Scrapings of these ulcers invariably revealed the presence of numerous balantidia. These ulcers healed in each case after successful treatment of the infection. Physical examination commonly revealed tenderness and patchy thickening of the colon. No death occurred in the series.

Treatment

Until it became evident that acetarsol ("stovarsol") was a specific treatment, other drugs were given a trial. Two cases were admitted to hospital with positive stool reports, but no balantidia were found after admission, and no treatment was given.

Sulphaguanidine.—A daily dose of 20 g. was given to seven cases of uncomplicated balantidiasis. Three cases received a total of 20 g. each, one case 40 g., one 60 g., one 80 g., and one 100 g.

Mepacrine.—As mepacrine had proved successful in the treatment of giardiasis, it was given a trial. Five cases were each given 0.1 g. thrice daily. One case in this group had previously received sulphaguanidine, 80 g.

Mercury Biniodide.—In view of Shun-Shin's (1947) success with mercury biniodide, five cases were given two intramuscular injections of ½ gr. (32 mg.) with an interval of two days between injections.

Acetarsol.—Eleven cases were given 4 gr. (0.26 g.) thrice daily for five days, a total of 60 gr. (4 g.). Fifty cases were given 4 gr. (0.26 g.) thrice daily, until the stools became negative, when treatment was stopped. Of these 50 cases, 3 had one day's treatment—12 gr. (0.8 g.), 11 had two days' treatment—24 gr. (1.6 g.), 27 had three days' treatment—36 gr. (2.4 g), and 9 had four days' treatment—48 gr. (3.2 g.). Twenty cases which were positive at the follow-up or had relapsed within six months were also treated with acetarsol until the stools became negative. Six cases had two days' treatment—24 gr. (1.6 g.), 11 had three days' treatment—36 gr. (2.4 g.), and 3 had four days' treatment—48 gr. (3.2 g.) (see Table II).

TABLE I

No. of Cases Treated	Drug Used	Daily Dose	Days of Treatment	Method of Administration
7*	Sulphaguanidine	20 g.	1–5	Oral
5*	Mepacrine	0·3 g.	5	,,
5*	Mercury biniodide	½ gr. (32 mg.)	2	I.M. injection
11	Acetarsol	12 gr. (0·8 g.)	5	Oral
50 plus 20 followed up	,,	12 gr. (0·8 g.)	1–4	,,

Two cases had no treatment.
* Some of these cases were treated with two different drugs.

Thirteen further cases were treated with acetarsol, but as these men left the employ of the company, or were non-employees and could not be traced, they are excluded from further mention in this series. The treatment is summarized in Table I.

Table II summarizes the number of days of treatment and the quantity of acetarsol administered before the stools became negative in the last 50 cases of the series and in those cases which were positive at the follow-up or which relapsed.

TABLE II

No. of Cases	Days of Treatment	Amount of Acetarsol	
		gr.	g.
3	1	12	0·8
17	2	24	1·6
38	3	36	2·4
12	4	48	3·2

Average no. of days of treatment = 2·84.
Average quantity of acetarsol given = 34·1 gr. (2·3 g.).

Immediate Response to Treatment

Of the seven cases treated with sulphaguanidine, the stools became negative in four, and remained positive in three. In no case treated with mepacrine or with mercury biniodide did the stools become negative. One case with concomitant amoebic dysentery received 10 intramuscular injections of emetine hydrochloride, 1 gr. (0.65 mg.), but *Balantidium coli* persisted in the stools.

Acetarsol was given to the 61 original cases, to the two that relapsed within six months, and to the 18 that were positive at the follow-up. No case failed to respond to this treatment, the stools becoming negative in every case. In two untreated cases the stools spontaneously became negative.

Result of Follow-up

One of the two untreated cases had a positive stool at the follow-up six months later. Acetarsol was given until the stools became negative, and six months later they were still negative. Sulphaguanidine, mepacrine, or mercury biniodide, or a combination of these drugs, was used in the treatment of 17 cases. All these had a positive stool at the follow-up after six months, and all were negative six months later, after treatment with acetarsol.

Of the 61 cases treated with acetarsol at the outset, two relapsed, one in a month and the other in two months, four had a positive stool on follow-up, and 55 a negative stool. The two relapses and the four which were positive at the follow-up were treated again with acetarsol, and all had a negative stool six months later.

All cases in the series were permanently cured by acetarsol, although two treatments were required in six cases. Table III summarizes the immediate response to treatment and the result of the follow-up.

TABLE III

No. of Cases	Treatment Given	Immediate Result of Treatment		Relapses	Follow-up	
		Stool Pos.	Stool Neg.		Stool Pos.	Stool Neg.
2	None	—	2	?1	1	1
7	Sulphaguanidine	3	4	—	7	—
5	Mepacrine	5	—	—	5	—
5	Mercury biniodide	5	—	—	5	—
61	Acetarsol	—	61	2	4	55

Discussion

The pathology of balantidiasis has been thoroughly investigated by several workers (Walker, 1913; Strong, 1942; Koppisch and Wilking, 1947). There is no divergence of opinion on the type of lesion produced or the

degree of severity these lesions may attain. The two main problems of balantidiasis remain to be solved: first, its mode of spread, and, secondly, its treatment.

Opinion is divided on whether or not the pig plays any part in the spread of human balantidiasis. Walker (1913) is of opinion that pigs serve as a reservoir for human infection, and Craig and Faust (1940) state that 25% of cases give a history of contact with pigs. Neither, however, produces evidence of the transfer of the infection from a pig to man. The evidence to support the theory of infection being contracted from pigs is therefore only presumptive. Ostroumov (1947), after studies of abattoir workers, states that he is convinced that the pig plays no part in the epidemiology of human balantidiasis. Ferri (1943), from observations on a group of children in a mental hospital in Tomsk, concluded that the infection was passed from child to child. In my series of cases it is certain that pigs played no part in the transmission of the disease. It may therefore be concluded that balantidiasis may be contracted from pigs, but it is certain that the disease can be transmitted without the pig acting as an intermediate host.

In the group of children studied by Ferri no cysts were seen. Neither in my series were any cysts seen in numerous stool examinations in each of 87 cases. It therefore seems a logical conclusion that transmission can occur in the active ciliate state, although the generally accepted theory is that infection occurs by swallowing cysts.

The first experiment to produce human balantidiasis was carried out in 1896. Andrews (1930) cites Cassagrandi and Barnagallo as having in that year fed balantidia from man and pigs to human volunteers, but they failed to infect them. Ziemann, in 1925, again cited by Andrews, fed balantidia from chimpanzees to men, but also failed to infect them. In view of the number of different species of *Balantidium* described since these early experiments, however, we cannot be sure that it was *Balantidium coli* which was actually used. Knowles and Das Gupta (1934) fed trophozoites and cysts of balantidia from the monkey *Macacus rhesus* to two men. Neither developed balantidiasis. However, it is now known that the rhesus monkey is infected by *Balantidium simile*, which is not pathogenic to man, and balantidiasis would not therefore develop. Young (1950) fed cysts and vegetative *Balantidium coli* in gelatin capsules to two volunteers. Over a period of 10 years neither developed diarrhoea or passed cysts or trophozoites in the stools. The ciliates given were obtained from a human case of balantidiasis. No intermediate host was found in my series, and the mode of transmission of balantidiasis must remain open to debate.

Sweeney (1929) carried out experiments on guinea-pigs with balantidiasis in an endeavour to find a suitable drug for treatment. Of many substances tried, she found the arsenicals gave the best results, and more particularly acetarsol, tryparsamide, and "parosan." These drugs do not seem to have been used much in the treatment of human balantidiasis. Only one reference to the use of acetarsol was found (Atiles, 1943). Results in my series would indicate acetarsol to be of definite value. No success was obtained with mercury biniodide, as used by Shun-Shin (1947) and Pramanik (1947).

Summary and Conclusions

A series of 87 cases of balantidiasis among the workers of a large industrial concern in South Persia is described. The mode of infection is assessed, the method of the investigation outlined, and the result of treatment stated.

It is stated that pigs played no part in transmission of the disease, that man-to-man transmission is strongly suggested, and that acetarsol is an effective drug in the treatment of balantidiasis.

I should like to thank Dr. S. D. McClean, chief medical officer, Anglo-Iranian Oil Company, for permission to publish this paper, and Dr. I. S. Stewart, pathologist, Anglo-Iranian Oil Company, for much helpful criticism in its preparation.

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EXCHANGE TRANSFUSION IN SEVERE ANAEMIA

BY

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The object of this paper is to describe a technique for exchange transfusion in patients with severe anaemia. The technique has not, to my knowledge, been reported previously.

In exchange transfusion the patient's blood is exchanged for similar volumes of whole blood or packed cells. In the present method packed cells are used, and the general principle of combined exsanguination and transfusion is the same as that employed in the treatment of erythroblastosis and chronic leukaemia.

In severe prolonged anaemia, however, there is little cardiac reserve, and some cases exhibit cardiac failure with congestion. For such cases Victor Riddell (1939) suggested preliminary venesection before transfusion, but with the technique here described exsanguination and transfusion are done simultaneously.

Technique

The components of the transfusion apparatus are: (1) Packed cells; (2) giving set; (3) funnel calibrated in ml. for measuring volume of transfusion blood; (4) two lengths of 2-mm. bore polythene tubing; (5) cannula to unite giving set and polythene tubing; (6) cutting-down set; (7) measuring cylinder (1,000 ml.) calibrated in ml.; (8) heparin (5,000 units per ml.); (9) 50-ml. syringe with 3.8% sodium citrate or heparinized saline (5,000 units per litre normal saline); (10) sterile needle (for use in removing clots from tip of venous escape); (11) acriflavine-cetrimide skin preparation; (12) tourniquet. (Sterilization of polythene tubing: Farquhar and Lewis, *Lancet*, 1948, 2, 244.)

The apparatus for the transfusion is set up as shown in Fig. 1. Packed cells are run into the measuring funnel, and a little is allowed to run through the apparatus to clear it of air bubbles.

Cut-down.—A vein in the antecubital fossa is incised immediately distal to a venous valve. A transverse skin incision is made across the vein, the vein is mobilized, ligatures are passed beneath the vein, and the ends are brought out through the skin. A longitudinal incision is made into the vein. When the lumen is opened the haemorrhage is stopped by passing a haemostat beneath the vein. (The tension in the vein causes the walls to come together.)

FIG. 1.—Simple exchange transfusion.

The "polythene" tubing (2-mm. bore) is then inserted into the vein and pushed proximally for several inches. The transfusion is started at a rate of 10–15 drops a minute. The proximal ligature is tied.

Venous Escape.—A second polythene tube is washed through with 1 ml. of heparin (5,000 units) and inserted into the vein through the same incision in its wall. It is pressed distally down the vein for a few inches. Should a venous valve be encountered, it is better to withdraw the tubing a short distance, as a freer flow of blood results. The venous-escape tubing is secured with the distal ligature. Skin sutures are inserted and tied. The length of venous-escape tubing left outside the vein should be cut to about 6 or 8 in. (15 or 20 cm.). If it is longer, clotting within the tube is troublesome. The venous-escape tube is led into a measuring cylinder.

Control of Transfusion

The rate of transfusion depends on the rate of venous escape, both being measured volumetrically. The two rates should in most cases be equal. In the few cases of congestive failure needing venesection the venous escape may be allowed to exceed the volume transfused.

Venous escape should be rapid. Any tendency to slowing can be obviated by the use of a tourniquet to increase the venous pressure; palpation of the radial pulse will ensure that the tourniquet does not increase the systolic pressure. Once the rate of venous escape has been restored, the tourniquet should be released, as its prolonged application is painful.

Transfusion through polythene tubing is rarely troublesome, but clotting in the venous escape may occur. Clots form at the free end, and can be removed with a needle. A tourniquet applied distal to the proximal end of the transfusion tubing (in the vein) will increase the venous pressure and may expel such a clot. Otherwise, moving the tubing in the vein or syringing with heparinized saline (5,000 units per litre) may succeed. It is considered inadvisable to give systemic heparin, as the tendency to haemorrhage (already great in such patients) may be increased. Dicoumarol is, of course, contraindicated.

The physician in charge of the transfusion must remain at the bedside or within calling distance of the patient throughout the transfusion. A special nurse is needed for whole-time duty with the patient.

During transfusion the following are observed: (1) filling of neck veins; (2) half-hourly pulse; (3) blood pressure—hourly readings suffice; (4) drip rate and venous escape (drops/minute), half-hourly (used only as a rough check on exchange rates); (5) drip volume/unit time (half-hourly); (6) venous-escape volume/unit time (half-hourly); and (7) clinical observations.

The value of direct measurements of venous pressure during exchange transfusion has yet to be ascertained.

The following are illustrative cases. Case 1 particularly shows the need for simultaneous exsanguination.

Case 1

A man aged 59 suffering from pernicious anaemia came under our care on May 4, 1949. On admission he was very pale and very weak; he was unwilling to move, and was too ill to give a history. A blood count showed: haemoglobin, 3.4 g./100 ml. (23%); red cells, 970,000; colour index, 1.18; reticulocytes, 0.8.

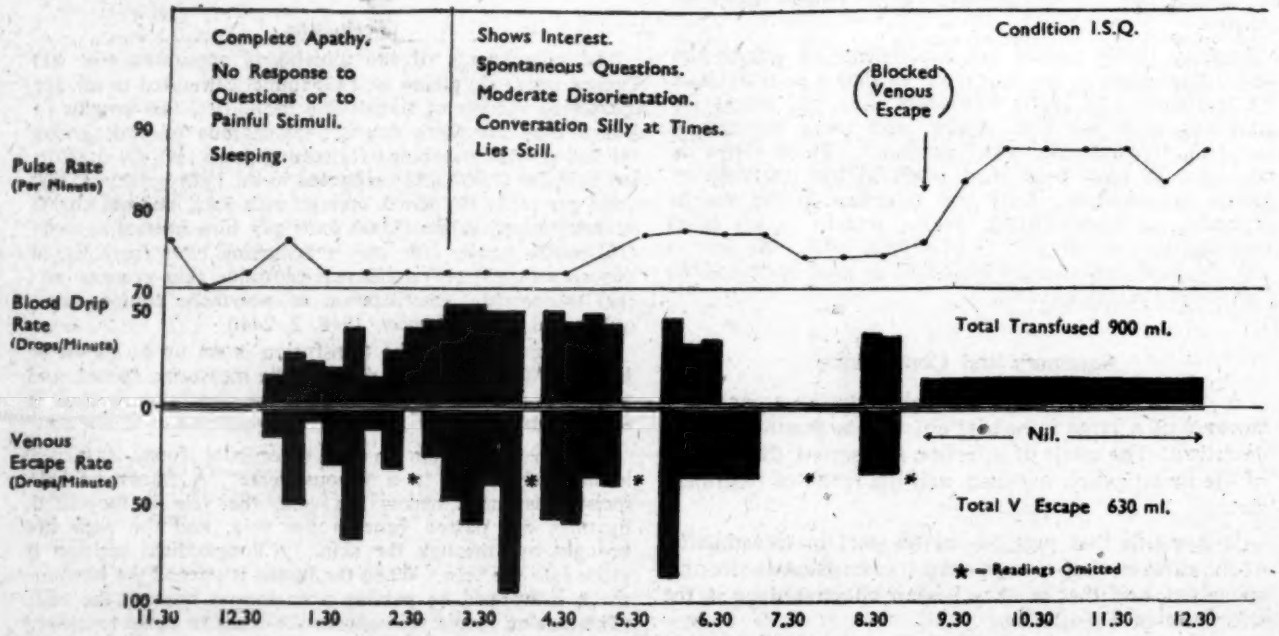

FIG. 2.—Case 1. Exchange transfusion.

Replacement transfusion was started at 11.30 a.m. on May 5, using 1 mm. polythene tubing. The venous escape was troublesome. Fig. 2 shows the wide fluctuations in venous-escape rate. Nevertheless, after each reading the venous-escape rate and transfusion rates (in drops a minute) were made equal.

From the start of the transfusion until about 9 p.m. there was a progressive improvement. He lost his complete apathy, took an interest in things about him, and began to ask questions spontaneously and even to smile at times.

At 9 p.m. the venous escape blocked completely, and a slow direct transfusion was allowed to continue. There was no further improvement in his condition. Instead there was a statistically significant rise in pulse rate coincident with the blocking of the venous escape. The mean pulse rate before 9 p.m. was 74 (standard deviation 2.03); after 9 p.m. it was 86 (standard deviation 4.25). On May 6 the Hb was 6.8 g./100 ml. (46%) and red blood cells 2,480,000. Next day the Hb was 5.3 g./100 ml. (36%) and red blood cells 1,850,000. The total volume transfused was 900 ml.; the total venous escape was 630 ml.; and the duration of transfusion was 13 hours.

Case 2

A man aged 70 had suffered from symptoms of idiopathic steatorrhoea for three years, when in 1947 he developed a reticulum-cell sarcoma of the palate. Repeated recurrences of metastases in mediastinum and skin were treated successfully by radiotherapy. In July, 1949, he was admitted once more. He was very pale and weak, and had purpuric spots on his arms and legs. There was an apical systolic murmur; the pulse was feeble at 90; and the B.P. was 90/80. On July 6 a blood count showed: Hb, 3.99 g./100 ml. (27%); red cells, 1,430,000; colour index 0.91; platelets 20,000 per c.mm.

An exchange transfusion was carried out on July 7. This was the last of the present series of replacement transfusions, and is the most complete in data. Fig. 3 demonstrates the progress in the transfusion.

The blood pressure rose very gradually from 110/60 to 140/85 during the transfusion. The pulse pressure increased only by 5 mm. Hg. This is not a significant change. The pulse remained at 110 until 8.15, when the venous escape blocked. Thereafter it rose slightly to 120, reaching this rate at 9.15 p.m., when the transfusion was stopped. This rise is probably significant, but not certainly so.

The cumulative blood-drip volume and the cumulative venous escape show a marked discrepancy. (It will be noted that there were half-hourly readings of blood drip volume, but only two readings of venous-escape volume were taken.) This discrepancy was noted when the first cumulative venous escape reading was taken. The blood-drip rates and venous-escape rates in drops a minute before the first cumulative venous-escape reading had not given any indication of an inequality.

At the outset the patient was very pale and his respirations were quick and sighing. He preferred to be supported on a back rest. He was very weak. His colour improved quite soon after the transfusion was begun. His breathing became easy and unhurried by 4.45 p.m., but he remained very weak. There was never any congestion of the neck veins. The total volume transfused was 1,020 ml., the total venous escape was 1,080 ml.; and the duration was seven hours. On July 8 a blood count showed: Hb, 5 g./100 ml. (34%); red cells, 1,880,000; colour index, 0.9. In a few days he became weaker and was given a direct transfusion. His progress was relentlessly downhill. He was constipated until July 11, when melaena occurred, so it is possible that he was bleeding into the bowel at the time of his transfusion. Death occurred on July 14. At the post-mortem examination the clinical diagnoses were confirmed. There was, in addition, oedema of the left lower lobe, but no dilatation of the atria or ventricles. A recent subdural haemorrhage and gastro-intestinal haemorrhages were present.

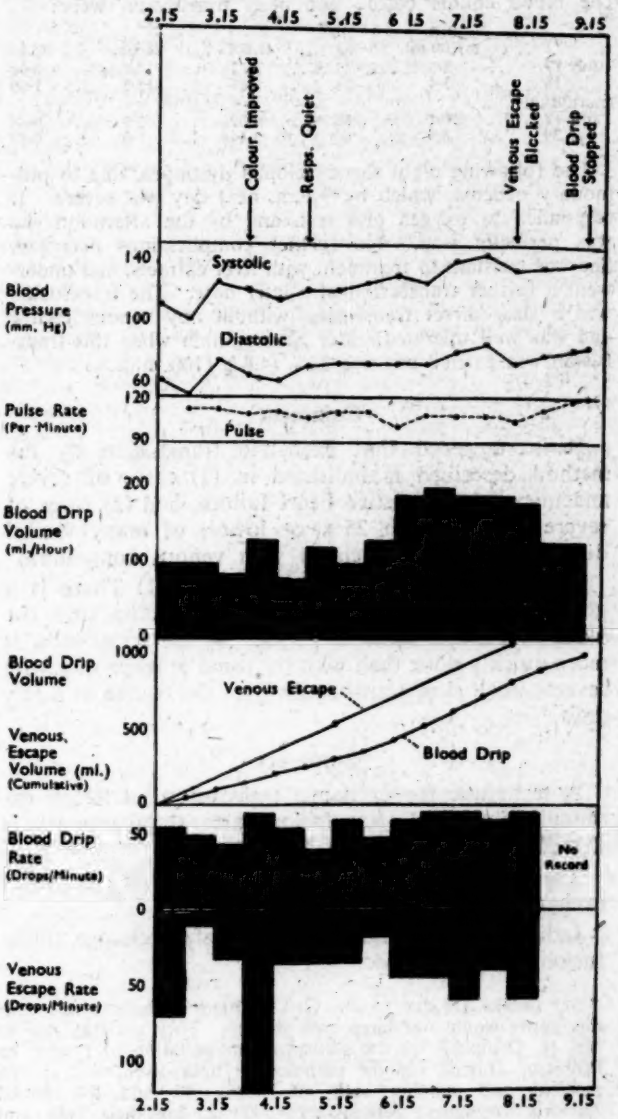

FIG. 3.—Case 2. Exchange transfusion.

Case 3

A frail old lady was admitted with profound pernicious anaemia. Her feet had been swollen in the evenings throughout the previous two months, though this had gone since she had been confined to bed. There was no evidence of congestive heart failure.

It was decided to carry out an exchange transfusion; 2-mm.-bore polythene tubing was used. The transfusion lasted six and a half hours, and in that time 2,300 ml. was transfused, and 2,900 ml. removed (to the nearest 100 ml.).

The pulse remained between 80 and 90 throughout the transfusion. The total amounts exchanged were large in comparison with previous cases. Throughout the transfusion, however, the patient gradually improved; she became warmer and her colour returned. She was cheerful while awake and untroubled in her sleep. She was never distressed in any way, and never showed filling of the neck veins.

Slight puffiness of the eyelids was noted in the early hours of the morning when the transfusion was stopped.

At that time the pulse rose to 88. With the exception of one reading (at 9.30 p.m.) the pulse had not exceeded 84 prior to this last reading.

She was well next day. The change was very gratifying. The blood counts before and after transfusion were:

	Hb g./100 ml.	Hb %	R.B.C.	Retic.	C.I.
July 17	3·3	22	1·12	14·8	0·99
„ 18	3·4	23	1·07	15·2	1·08
Transfusion					
July 19	10·1	68	4·02	2·2	0·84
„ 24	8·4	60	3·444	1·0	0·87

The following night she developed dyspnoea, due to pulmonary oedema, which by 9 a.m. next day was severe. It responded to oxygen and rest, and by the afternoon she was perfectly well. No further complications occurred. She was resistant to treatment with liver extracts, and underwent a further transfusion at a later date. The transfusion was a slow direct transfusion without any venous escape and was well tolerated. Her haemoglobin when this transfusion was carried out was 32% (4.7 g./100 ml.).

Comment

It is suggested that exchange transfusion by the method described is indicated in (1) cases of severe anaemia with congestive heart failure, and (2) cases of severe anaemia (Hb 25% or lower) of many weeks' duration but not associated with venous congestion.

The advantages of the method are: (1) There is a greatly reduced risk of circulatory overloading, since the blood volume is controlled; and (2) the transfusion is more quickly done than with the usual practice of giving several small slow transfusions over the course of a few days.

Summary

A technique for exchange transfusion, in which exsanguination and transfusion are simultaneous, is described.

Three cases of severe anaemia are reported in which exchange transfusions were performed.

Indications for, and advantages of, exchange transfusion are mentioned.

My thanks are due to Dr. C. C. Ungley without whose help this paper would not have been written. They are due also to Mr. H. Campbell for the statistical interpretation of results, to Professor Duguid for the pathological data given, and to the medical and nursing staff of wards 10 and 12, Royal Victoria Infirmary, Newcastle-upon-Tyne, for their help and encouragement.

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On March 19 the first party of 25 British children left for Vordinborg, in Denmark, under the Anglo-Danish Society's scheme for their treatment at a Danish sanatorium. The children were chosen by the medical committee of N.A.P.T., and the British Red Cross helped to make the travel and welfare arrangements. Funds to meet the cost of transport and maintenance of this and subsequent parties of British children suffering from tuberculosis will come from the special fund created for the purpose by the Anglo-Danish Society. The ages of the children range from 8 to 15; there are 14 boys and 11 girls, mainly from London and the Birmingham and Oxford regions. It is expected that treatment in most cases will last about six months. The scheme will do something to reduce the waiting-list for beds in this country.

HOMOLATERAL PYRAMIDAL SIGNS WITH TUMOURS OF THE POSTERIOR FOSSA

BY

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It is well known that tumours and other displacement lesions of the cerebral hemispheres sometimes give rise to *homolateral* pyramidal signs. Kernohan and Woltman (1929) made a careful study of this phenomenon. The expanding lesion causes displacement of the brain stem, so that indentation of the *opposite* cerebral peduncle is produced by the edge of the tentorium; the affected pyramidal fibres cross below, in the decussation of the pyramids, to the same side as the lesion. The following case is cited as an example.

Illustrative Case

Case 1. Subdural haematoma of the right hemisphere: weakness of the right hand and arm, and equivocal right plantar response.—A man aged 47, who suffered from sleepiness for three months and headache and irritability for one month, became suddenly unconscious on June 22, 1946. There was no history of a head injury. On admission to hospital the same day he was conscious but very drowsy. There was no papilloedema and there were no localizing signs. The cerebrospinal fluid contained 80 mg. of protein per 100 ml., and it was yellow after treatment in the centrifuge. During the next few days the drowsiness fluctuated. Two weeks after admission the patient was referred to us. At that time there was *weakness of the right hand and arm* and the *right plantar response was equivocal*. Ventriculography, performed on July 6, showed displacement of the anterior part of the ventricular pattern to the left. A right frontal burr-hole revealed a subdural haematoma, which was solid and adherent to the membranes. A bone-flap was turned down and the haematoma exposed after wide reflection of the dura mater. The whole of the superolateral surface of the hemisphere was involved. There was no haematoma on the opposite side.

Comment.—It is not so well known that a closely similar phenomenon may occur with tumours in the posterior fossa, though Kernohan and Woltman found records of five examples in the series of intracranial tumours which they investigated, and Gould (1928) stressed the occurrence of *homolateral* hyperreflexia with some tumours of the posterior fossa. Tumours of the frontal region may produce "cerebellar" signs, and, conversely, slowly growing tumours in the posterior fossa may cause little or no disturbance of cerebellar function. Therefore the possible occurrence of pyramidal signs on the same side as a posterior fossa tumour may cause further difficulty in diagnosis.

In the following five cases various homolateral pyramidal signs were observed.

Case Reports

Case 2. Cyst of the left cerebellar hemisphere: paresis of the lower half of the face and weakness of the upper extremity on the same side.—A woman aged 46 was admitted to hospital in April, 1949, with a six-weeks history of intermittent headaches, giddiness, and vomiting. She showed a

mild degree of neck stiffness, moderate hypotonia of all the limbs, brisk knee-jerks, and considerable apathy. The patient refused ventriculography and left the hospital. She was readmitted six weeks later with bilateral frontal headache and insomnia. Diplopia had been noticed for two weeks. She was doubly incontinent, and neck rigidity, bilateral papilloedema, *marked left lower facial paresis*, and *weakness of the left arm* were present. All the limbs were hypotonic, especially on the left side. The left ankle-jerk was diminished and the plantar reflexes could not be elicited. The patient was given a general anaesthetic, as she refused local infiltration; while the towels were being arranged preparatory to needling of the frontal lobes she suddenly died. At necropsy a large cyst was found in the left cerebellar hemisphere. Microscopical examination of a nodule in the wall of the cyst failed to show any tumour cells.

Case 3. Astrocytoma of the left cerebellar hemisphere: paresis of the lower half of the left side of the face.—A man aged 43 had been perfectly well until three weeks before admission to hospital on October 17, 1949. During this period he had developed headache, vomiting, and severe lassitude; he had also had a cough for the same time. Drowsiness and slight neck stiffness were present, but no other physical signs. Several relations had succumbed to tuberculosis of the lungs; tuberculous meningitis was therefore suspected. The cerebrospinal fluid was slightly turbid; it contained 200 mg. of protein per 100 ml., 500 cells (all polymorphs) per ml., increased globulin, and 80 mg. of sugar per 100 ml. The patient's temperature ranged between 97.8 and 101.4° F. (36.6 and 38° C.). During the next two days deterioration occurred and on October 19 he was transferred to the neurosurgical department in a stuporous condition. There was no papilloedema. *There was a marked left lower facial paresis*, but no other physical signs. Ventriculography showed enlargement of the lateral ventricles and the third ventricle. A large tumour was partially removed from the left cerebellar hemisphere; histological examination showed it to be an astrocytoma.

Case 4. Astrocytoma of the left cerebellar hemisphere: paresis of the lower half of the left side of the face.—A youth aged 17 gave a history of frontal and suboccipital headache, vomiting, and loss of appetite for 14 weeks. On admission to hospital on October 12, 1949, moderate bilateral papilloedema and a slight *left lower facial paresis* were present, but there were no other physical signs. Radiography showed several Wormian bones at the pterion on both sides. Ventriculography on October 18 showed great enlargement of the lateral ventricles and the third ventricle. The posterior fossa was explored through a horseshoe incision. Reflection of the dura mater showed the left cerebellar hemisphere to be more prominent than the right, and there was considerable herniation of the tonsils, the left descending lower than the right. A brain cannula passed into the left cerebellar hemisphere entered a cyst containing 25 ml. of yellow fluid (7 g. of protein per 100 ml.). The cyst and its associated tumour were removed on another occasion (histology: astrocytoma).

Case 5. Solitary secondary carcinoma in left cerebellar hemisphere: paresis lower half of the left side of the face, and positive Babinski sign on the same side.—A man aged 55 was admitted to hospital in coma on February 15, 1950. His wife reported that for two months he had suffered from severe recurrent frontal and vertical headache, recently accompanied by vomiting. For three weeks there had been a cough and thick yellow sputum. He did not respond to pressure on the supraorbital nerves. Marked neck stiffness and advanced bilateral papilloedema were present. Radiography of the chest showed a large shadow on the right side; its appearance was that of a carcinoma of the bronchus. The patient recovered consciousness and was able to cooperate. There was a slight *left lower facial paresis*, a *left Babinski response*, and hypotonia of both legs. There were no other physical signs. The right frontal lobe was needled, but no evidence of a tumour was found. Ventriculography showed enlargement of the lateral ventricles and the third ventricle. Burr-holes were made over the cerebellar hemispheres and a cannula was passed into the left lobe: 6 ml. of thin pus was withdrawn; the fluid contained pus cells, but no tumour cells. Penicillin was instilled into the cavity and the patient's condition improved. Needling was repeated the next day and tissue containing tumour cells was obtained. The patient died on March 4, and at necropsy a large solitary tumour was found in the left cerebellar hemisphere, secondary to a bronchial carcinoma.

Case 6. Meningioma of the right side of the posterior fossa: positive Babinski sign on the right, and later paresis of the lower half of the right side of the face.—A man aged 48 complained of occipital headaches for six months. At first they occurred only in the morning, but later they persisted throughout the day. For about two months there had been vomiting, loss of weight, and defective memory. He was admitted to hospital on February 8, 1950, with very severe headache, which made him somewhat uncooperative. There were moderate bilateral papilloedema and nystagmoid movements on fixation to either side. There was a *positive Babinski sign on the right side*. Five days later he developed a *right lower facial paresis*, but on this occasion both plantar responses were normal. Needling of the left frontal lobe was negative. Later, ventriculography showed enlargement of the lateral ventricles and the third ventricle. Exploration of the posterior fossa on March 14 revealed on the right side a large extracerebellar tumour, which was removed; it was later shown to be a meningioma.

Comment

The pyramidal signs observed in these cases were all on the same side as the tumour, and included the central type of facial paresis, weakness of the upper limb, and a positive Babinski sign—in variable combinations. It is noteworthy that in none of the cases was any weakness of the lower limb found. The lower limb has never been paretic in our cases of supratentorial tumour with homolateral pyramidal signs. Ectors (1945), however, states that the leg is always affected first, and to a greater extent than the arm, and he attributes this effect to the distribution of the pyramidal fibres in the cerebral peduncles as demonstrated in monkeys: the leg fibres are placed laterally, the arm fibres in the middle, and the face fibres medially (Simpson and Jolly, 1907).

Our own observations are supported by the work of Walker (1949) and of Guiot and Pecker (1949), who have divided the lateral part of the opposite cerebral peduncle for the relief of unilateral involuntary movements. Their case records show that after the immediate post-operative hemiplegia the paralysis recovers rapidly, leaving some residual weakness of the face and arm, with no detectable weakness of the leg.

It therefore appears that, whatever the arrangement of the pyramidal fibres in the peduncles may be, the more important factor is the degree of bilateral cortical representation of the parts concerned. Bucy and Fulton (1933) have obtained ipsilateral motor responses in monkeys by electrical stimulation of the motor and premotor cortex, and their work has been confirmed by Wyss (1938). In classical cerebral apoplexy the arm is more paralysed than the leg; and, after hemispherectomy for infantile hemiplegia, recovery of motor function is more marked in the leg than in the arm (Krynauw, 1950).

Summary and Conclusion

Some intracranial tumours displace the brain stem enough to cause indentation of the *opposite* cerebral peduncle; and thus both supratentorial and infratentorial tumours sometimes give rise to pyramidal signs on the same side as the tumour, and cause difficulty in localization.

The literature on this subject is largely concerned with supratentorial tumours; this communication aims at redressing the balance by the presentation of cases of

infratentorial tumours in which homolateral pyramidal signs occurred and definite cerebellar signs were lacking. The practical implications of the syndrome are indicated.

The association of increased intracranial pressure with mild pyramidal signs, without other localizing evidence, should lead to ventriculography rather than to angiography, unless electroencephalography shows a definite focus of delta activity in one cerebral hemisphere.

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Medical Memoranda

Emergency Operation on Patient under A.C.T.H. and Cortisone Therapy

The decision to carry out an emergency operation should not be delayed for fear of a breakdown of the wound and of poor healing due to the effect of the new antirheumatic agents on tissue repair. The following case of a strangulated femoral hernia in which sound healing occurred within the normal time limits shows how wrong it would have been to procrastinate.

CASE REPORT

A spinster chiropodist aged 52 had been treated for rheumatoid arthritis in both hands, elbows, shoulders, ankles, and knees by several courses of gold injections, later with progesterone, and during the past seven months with A.C.T.H. and cortisone. A.C.T.H. was given in doses up to 200 mg. in 24 hours, the cortisone in daily doses of 100 mg., until the day of the operation.

A right femoral hernia, which the patient had first noticed two and a half years previously, was painful for four days and then became tender, firm, and tense. The skin in the groin was found to be red and oedematous. There was a pyrexia up to 100.5° F. (38.1° C.). Lower abdominal pain and sickness followed. An enema gave a good faecal result, with flatus. The pyriform hernia, extending into the femoral triangle, was thought to contain strangulated omentum and it was decided to operate immediately.

Under general anaesthesia an incision was made, starting over the neck of the hernia and extending vertically downwards for 3 in. (7.5 cm.) into the femoral triangle. The tense sac, the size and shape of an outdoor cucumber, contained blood-stained fluid and necrotic omentum, as confirmed on section. This was resected. For the herniotomy and closure of the femoral canal linen thread was used. A corrugated rubber drain was inserted for four days, and the considerable subcutaneous fat layers were closed by interrupted catgut stitches.

Systemic soluble penicillin was given, 250,000 units six-hourly for five days, and ascorbic acid for three weeks post-operatively in doses of up to 100 mg. three times a day by mouth. Cortisone, which was the only antirheumatic agent administered at the time, was reduced from the daily dose of 100 mg. to 75 mg. All sutures were removed on the fourteenth post-operative day. The abdominal symptoms had subsided on the morning after the operation and the wound healed soundly. When examined six weeks later the scar was firm and no cough impulse was felt.

COMMENT

In accordance with the widespread belief in the depressive effect of adrenocortical steroids on wound-healing, through their influence on connective tissue (Plotz *et al.*, 1950), operations are rarely performed on patients thus treated. Repair is said to be decreased and scar formation largely inhibited if these substances are given in large doses. No reports are available in the British literature on the subject. Hume and Moore (1950), however, report on the use of these substances to improve the general condition in surgical patients. The wound in my patient healed in spite of the presence of inflammatory changes in the skin and omentum, and in spite of strangulation. Cessation of cortisone treatment may have led to a sudden loss of stimulation of the suprarenals and to a rebound exacerbation of rheumatoid and mental symptoms.

Some precautions to safeguard wound-healing could, however, be accepted as rational. General anaesthesia was used in preference to local analgesia, which may temporarily lower the vitality of the tissues; chemotherapy was indicated, even if sepsis would not have threatened; and ascorbic acid was tried empirically to block the effect of cortisone on mesenchymal tissues. Non-absorbable suture material is preferable, as it maintains in apposition tissues the wound-healing of which is potentially impaired. The lower approach to the femoral hernia was chosen in preference to Lotheissen's because the content of the sac was thought to be omentum, and because the apex of the elongated sac extended direct into the femoral triangle. The possibility of the breakdown of the wound was a contributory indication for the lower approach, where the structures in the inguinal region were not endangered. The fact that the patient's wound had healed after a dental extraction in the third month of A.C.T.H. therapy was an encouragement for immediate operation. It was also remarkable how indefinite and masked the clinical symptoms were and that even the rise of temperature was delayed in the presence of sepsis and of strangulation. This was probably due to the lowered vitality of mesenchymal tissue. The administration of the new antirheumatic substances should, however, not deter the surgeon from an emergency operation, which should, if required, be performed without delay.

I am indebted to Mr. J. M. Milloy, Dr. B. Gottlieb, Dr. A. Poteliakhoff, Dr. O. Savage, and Dr. I. M. Tweed for their kind interest in this case and for their advice.

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Glandular Fever

The five cases of glandular fever reported below all occurred in one district within eight months; no connexion, however, has been traced between any two of them. Chloramphenicol was given early in two cases and later in two others without affecting the course of the disease. This would tend to refute the conclusions drawn by Kane (1951). Three cases were similar and typical, and two had unusual courses. A sign which may be helpful in diagnosing the atypical case, and which was present in all cases, is described.

CASE REPORTS

Case 1.—A male clerk aged 26 felt ill on November 7, 1950, but ascribed it to the shock of the death of his mother, whom he had been visiting in a regional hospital (in which he may have been infected). On November 14 he went to bed with fever and sore throat, and was found to have an adenitis out of proportion to the existing tonsillitis. The glands involved were those under the upper parts of the sterno-mastoids and also in the axillae. On

November 16 exudate was present in a membranous plaque over both tonsils, and there was complete nasal obstruction. On this day the total white-cell count was 26,500, of which 89% were mononuclear. The Paul–Bunnell reaction was positive in a dilution of 1 in 28. He began taking chloramphenicol on November 17 in divided doses totalling 3.25 g. daily. On November 21 the exudate had cleared and there was general improvement in fever and in the degree of adenitis. The nasal passage was clear. On the 23rd the total white-cell count was 7,500, but mononuclears formed 76%. The mouth and tongue were sore, but chloramphenicol was continued until November 26. Repeated white-cell counts showed a normal total, with the mononuclears falling slowly from 73% on December 4 to 53% on January 6, 1951, when he returned to work. The proportion was still 52% when he was last seen on March 6. The prodromal stage and the acute stage each lasted about a week, and the patient was off work for two months.

Case 2.—A bright young female hairdresser aged 18 was seen on January 6, 1951, with a small indefinite urticarial rash about the neck and shoulders, which cleared in a week. At this time a menstrual period, abnormally delayed for a fortnight, appeared. On January 17 she went to bed with fever, sore throat, and adenitis. On the 20th an exudate was present over both tonsils, the nose was blocked from behind, and the total white-cell count was 14,200, of which 75% were small lymphocytes. Chloramphenicol was given on January 21 in a total daily dose of 3 g. and continued for eight days, during which time the membrane separated, the fever and adenitis subsided, and the nose cleared. The Paul–Bunnell reaction was positive in a dilution of 1 in 3,584. The total white count was normal on January 29, but mononucleated cells formed from 60 to 70% until she was last seen on June 16. The prodromal stage lasted 10 days, the acute stage lasted about 10 days, and she was off work for nearly three months.

Case 3.—A girl aged 8 had not been well for a fortnight before she was first seen on July 14, 1951, when she complained of a sore throat. There was no exudate, and it was noted that the bilateral glandular enlargement seemed excessive and was situated chiefly under the upper part of each sterno-mastoid. The temperature was 101° F. (38.3° C.), and she was given "sulphatriad" suspension. On July 16 there was still fever, with a follicular exudate on both tonsils and complete nasal obstruction. A few slightly enlarged glands were present in the axillae and groins. The girl had not been immunized, so 20,000 units of diphtheria antitoxin was given. The white count was 13,200 (polymorphs 47%, lymphocytes 48%, monocytes 5%). The fever and the pharyngeal condition remained the same until July 19, when the fever ceased and the glands decreased in size. Next day the exudate had gone. On the 23rd the nose became clear, coinciding with great reduction in the glandular enlargement. On July 26 the Paul–Bunnell reaction was positive in a dilution of 1 in 448, the total white count was normal, but 87% were lymphocytes and mononuclear cells. On July 30 the child was up and playing about.

Case 4.—The young wife of a professional man had an illness the onset of which was insidious but probably occurred late in September, 1950. She felt tired and had a frontal headache which was severe, especially in the mornings, and which persisted for about a month. For the last three weeks in October there was a low evening fever. She had some halitosis, one small epistaxis, a blockage of the right eustachian tube, and a markedly nasal voice. In spite of the absence of any nasal catarrh the sinuses were examined radiographically and a condition of mucosal thickening was reported in both frontal and both maxillary sinuses. A blood count on November 9 showed: Hb, 62% (8.7 g.%); white cells, 5,400 (lymphocytes 60%, monocytes 26%). The Paul–Bunnell reaction was positive in a dilution of 1 in 448. Chloramphenicol was started on November 14 in total daily doses of 2.5 g., and continued for six days. On the 16th the spleen was just felt and a few small glands were found in the posterior triangles of the neck. The fever had settled. She had been in bed about nine weeks. Convalescence was extremely slow, with physical weakness and mental depression lasting until early in the new year. The blood count was normal in February, 1951, though the haemoglobin was still low (75%).

Case 5.—A male weaver aged 29 attended on January 8, 1951, for a fever with slight cough and some backache which settled in three days. On January 17 he developed jaundice, having had nausea, anorexia, and upper abdominal discomfort for a few days previously. The jaundice lasted a week and was clearing when, on January 20, he developed fever, a tonsillitis with membranous exudate, nasal obstruction, and many small palpable glands all over the neck. The Paul–Bunnell reaction was positive in a dilution of 1 in 896. Chloramphenicol was started, and was continued for six days in a total daily dose of 3 g. The total white-cell count was 24,000, of which mononucleated cells formed 89%. The acute stage lasted until January 27. On February 9 the total leucocyte count was normal, but mononuclear cells still formed 71%; on June 16 the mononuclears totalled 69%. He was off work for over three months.

COMMENT

Four of the cases were of the anginose type, though three were in young adults. The clinical picture was practically identical in the first three cases. In two of these chloramphenicol was given reasonably early, in adequate doses, and continued for about a week. In the third it was deliberately withheld. The course in all three diseases was identical. The two other cases had chloramphenicol at a later stage without any effect that could be attributed to its use. Prodromata were generally vague, but Case 2 had a rash and amenorrhoea. This symptom has not been found to be recorded before. Case 5 was remarkable. Mild upper respiratory infection was followed by hepatitis with jaundice, and finally by typical monocytic angina. It is not possible to say whether this was a single infection or a succession of two or three separate infections. The latter seems unlikely.

All the patients showed evidence of enlargement of the adenoids, with nasal obstruction in four. Eustachian obstruction occurred in one (Case 4): it was for a fortnight the only evidence of enlargement of lymphatic tissue in this difficult case, and was therefore a very significant sign. Nasal obstruction was not unimportant in the others, for its presence contributed materially to their discomfort during the day and their restlessness at night.

Although Custer and Smith (1948) report nasopharyngeal lymphoid hyperplasia as a constant finding in nine necropsies, no mention is made of nasal obstruction as a symptom or sign of the disease, nor has it been found mentioned in any other articles. It is interesting that lymphatic communications exist between the upper nasopharynx and the subarachnoid space, in view of the association of a lymphocytic meningitis with glandular fever. Glandular fever is not uncommon. Ten cases have been diagnosed in the last five years, while no case of diphtheria has been seen.

JOHN F. GOODALL, M.D.

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Speaking at the Royal Institution on March 14 Professor J. Read said there was little realization to-day of the extent to which alchemical conceptions and imagery permeated the thought and art of the Middle Ages. Most of the early alchemical engravings delineated apparatus and practical operations. Early in the seventeenth century, when alchemy had already begun to wane, some of the most interesting and artistic engravings were produced. This period coincided with the development of copper engraving. Alchemical engravings of this period often called up visions of surrealist paintings. Indeed, surrealists had much to learn from the disturbing and incongruous juxtapositions of alchemical art.

Reviews

TUMOURS OF THE EYE

Tumors of the Eye. By Algernon B. Reese, M.D., D.Sc. (Hon.), F.A.C.S. (Pp. 574; 511 illustrations, 122 in full colour. £7 7s.) London: Cassell and Co. 1951.

Occasionally, but only occasionally, a really good book appears in medicine: this is one. Those of us who have visited Algernon Reese in his laboratory at the Presbyterian Medical Centre, New York, would expect a book of his on the tumours of the eye—a field which he has made his own specialty for many years—to be original, reflecting his own views and personality. Those of us who have seen the impressive amount of pathological material which passes through his hands and the elaborate care with which it is studied and filed, so that it is available for constant reference, would expect it to be accurate, well presented, and comprehensive; and those of us who have seen him in the clinic would expect the pathology to be integrated with careful and illuminating clinical data and sound therapeutic recommendations. In none of these will the reader be disappointed.

It is astonishing how many types of new growth may be met with in the eye and its adnexa, some rarely, some commonly, so that a study of ocular tumours must needs be almost a complete treatise on neoplastic growths. Dr. Reese's long association with the Memorial Centre for Cancer and Allied Diseases in New York, in addition to his ophthalmological activities, has made him eminently fitted to correlate the characteristics and evolution of ocular tumours with those of tumours found elsewhere in the body, so that his book has an integrative philosophy rarely met with in ophthalmological publications, and it must be of interest to the general pathologist as well as the eye specialist. All these qualities—in addition to the fact that it is the first textbook dealing exclusively and extensively with this subject since Lagrange's classical publication in 1901—makes it an indispensable reference book. It is true that it is superbly published on art paper, beautifully printed, and replete with illustrations, many of them in colour; but in view of the value of its contents it is perhaps a pity that its cost puts its possession outside the scope of the student. In this respect the rising cost of books of this type has indeed become a problem, and it may be that a more "popular" edition might replace in ultimate value what would be lost in luxury.

STEWART DUKE-ELDER.

THE ELDERLY

Trends in Gerontology. By Nathan W. Shock. (Pp. 153. £1.) Stanford, California: Stanford University Press. London: Geoffrey Cumberlege. 1951.

The Social and Biological Challenge of our Ageing Population. Proceedings of the Eastern States Health Education Conference, March 31–April 1, 1949. (Pp. 184. 18s.) New York: Columbia University Press. London: Geoffrey Cumberlege. 1950.

The problems and burdens of an ageing population are one of the main anxieties of civilized peoples. A falling birth rate in many countries has been accompanied by an increase in the number of people reaching the higher age groups. This does not mean that there has been any increase in the ultimate expectation of life: that has not changed much. But a greater number of people than 50 years ago are now reaching normal old age. This is due in part to improvements in environmental hygiene, in part to the use of various new drugs, of which the antibiotics are the most obvious, and in part to causes we do not know. But the effect has been that there are fewer working people available to support an increasing unproductive section of the population, for it must not be forgotten that what used to be called "useless mouths" are increasing at both ends of the scale. But, worse than this, a policy of "full employment" and a worsening economic state of society have removed many people who would formerly have looked after their aged relatives into a more materially profitable sphere of work. Rowntree and Lavers, in their latest report, have shown that it is the old and the infirm who have not profited from the benefits of the Welfare State. It is interesting, therefore, to read in these two books from the U.S.A. of the problems that are facing administrators in that country and to find how similar these are to those that are found here.

In both books the discussion centres round the two main sides of the problem—the socio-medical one: What are we to do now, and in the immediate future, to ensure that old age shall be as pleasant and agreeable a time as were earlier years? The other (and much long-term work is needed here) is, What are the causes of ageing, and how can they be either mitigated or checked altogether? For such a plan both books ask for an increase in the facilities for biological research. Dr. Shock puts forward a well-argued plea for an institute of gerontology where the treatment of aged patients shall be carried on in association with research into the cause of their particular reaction to various illnesses and with a study of the socio-economic problems of old age. In addition, steps would be taken to encourage education of workers towards their retirement, so that they may be prepared, willingly, to accept new, perhaps less responsible, employment as a natural consequence of their growing older. There is something to be said in support of this plea, provided it is not forgotten that preventive measures can reduce the numbers requiring admission to hospital and that the elderly are best treated in wards that are an integral part of a general hospital. It is dangerous to push the specialty of geriatrics, if indeed it is a specialty, too far into isolation.

It is interesting to note how the proportion of elderly workers remaining in employment has steadily fallen since the beginning of the century in the U.S.A. as well as in this country. Yet the health of the elderly worker has, so far as can be made out, improved during the last 50 years. A good deal of work needs to be done to determine whether the added years that have been given to so many are really being used to their best advantage. The incentives to continue at work are not high, yet any physician can testify to the value of suitable employment in maintaining a healthy mind and body.

Dr. Shock's thoughtful and accurate little book is an interesting addition to the small collection of books on old age, while the collected papers from the New York conference contain a lot of useful information and, even more, of stimulating and provocative ideas.

AMULREE.

GYNAECOLOGY FOR STUDENTS

Handbook of Gynaecology. By Trevor L. S. Baynes, M.D., F.R.C.S., M.R.C.O.G. (Pp. 164. 15s.) London: Sylviro Publications. 1951.

This small book is a most interesting publication. It is well known among clinical teachers that there is a demand by senior undergraduates and postgraduate students for concise summaries to integrate all that they have read. In this volume the author has been at pains to avoid giving an exhaustive account of gynaecology and has written short essays on topics which are in the forefront of gynaecological thought. The essays combine theoretical considerations and descriptions of clinical investigations and operative technique. They are very well written, concisely arranged, and the reader has no difficulty in grasping quite easily the basic problems of the topic under discussion. Although the book is expensive, it may be confidently recommended to senior students and postgraduates.

Printing mistakes are numerous, and the spelling of such words as colporrhaphy should be accurate in a gynaecological textbook, nor should the names of Schröder and Sims be spelled wrongly.

WILFRED SHAW.

THE NEWBORN

Foetal and Neonatal Pathology. By J. Edgar Morison, M.D., B.Sc. (Pp. 366; 59 figures. £2 10s.) London: Butterworth and Co. 1952.

Dr. J. E. Morison has produced in *Foetal and Neonatal Pathology* an interesting and informative book, although the title is misleading. It is, of course, difficult to separate entirely some of the physiology of neonatal life from some of the disturbances which occur in the newborn period. A study of respiratory failure must take account on the one hand of the normal mechanism for the initiation of respiration after birth and on the other of the morbid changes found in babies who do not breathe properly. Whether or not these two aspects, the former to some extent wrapped up with clinical considerations, can strictly be treated together as pathology is open to doubt. To this extent Dr. Morison is sometimes rather muddling. When writing of strictly pathological changes he gives the impression of being very much on his home ground, where he has made valuable contributions to the subject. But in the section on prenatal disturbances, discussions on foetal nutrition and growth, for example, are less well done, and the chapter on prematurity might have been better balanced if a clinician with extensive experience of care of these infants had collaborated. (Incidentally, the Royal College of Physicians, not the Royal College of Obstetricians and Gynaecologists, was the body which took the lead in Great Britain in securing a definition of prematurity.) The third part of the book is on infections and is an interesting account of this most important and somewhat neglected field. Dr. Morison's own work on thrombosis in sepsis of the newborn is well summarized. The whole book is ambitious, well illustrated, and beautifully produced. It might be improved by limiting its scope to what has been observed in the study of disease.

ALAN MONCRIEFF.

DISEASES IN THE NERVOUS SYSTEM

Medical Neuropathology. By I. Mark Scheinker, M.D. Preface by Marion A. Blankenhorn, M.D. (Pp. 372; 186 figures. £3 15s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1951.

The title of this book does not quite explain its scope: it is essentially an account of the pathological changes in the nervous system which occur in diseases primarily involving other systems of the body, and it does not include all the non-surgical diseases of the nervous system. It is a companion volume to the author's two previous books on *Neurosurgical Pathology* and *Neuropathology: Its Clinicopathologic Aspects.* About half of the book is concerned with changes in the central nervous system in cardiovascular disease, and Scheinker develops the theory (on which he has published a number of papers) of vasoporosis, vasoparalysis, and vasothrombosis as the basis of reversible vascular disturbance in the brain. The last term implies thrombosis of "tremendously" dilated small cerebral venules and capillaries, and he reiterates his view that the majority of intracerebral haemorrhages in hypertension are of venous rather than arterial origin.

In other sections of the book he describes the cerebral manifestations of lung diseases and includes an excellent account of tuberculosis of the nervous system, neurological disturbances in the blood dyscrasias, and cerebral reactions to chemotherapy and various exogenous poisons. The short section on cerebral manifestations in liver diseases is disappointing; there is no account of recent biochemical findings in the discussion on the pathogenesis of hepato-lenticular degeneration, and, more surprisingly, Rh incompatibility is not even mentioned in the corresponding section on kernicterus. The chapter on the pathology of polyneuritis includes a description of considerable swelling of the nerve fibres of the spinal-cord roots and tracts and of the cranial and peripheral nerves in acute infective polyneuritis, and attributes the neurological disturbance in "jake" paralysis to muscle ischaemia resulting from changes in the peripheral arteries.

If this book is regarded as the author's somewhat individual outlook on certain aspects of neuropathology, it provides interesting and provocative reading, but it could not be recommended as an orthodox account of the subject. It is profusely and excellently illustrated.

J. W. ALDREN TURNER.

OESOPHAGEAL ACTION

The Esophagus and Pharynx in Action. A Study of Structure in Relation to Function. By William Lerche, M.D. (Pp. 222; 93 figures. £2.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1950.

On the cover of this book the claim is made that it will be accepted as a great classic and the most authoritative source of information on the subject in the world. It is difficult for your reviewer to decide if this is so. The book records a painstaking and earnest attempt to analyse and present the problem, based partly on a review of the literature and partly on personal observations and anatomical dissections of 100 specimens. In the embalmed material specimens were found which suggested that agonal regurgitation had occurred, and from these the author gives an interpretation of the mechanism of closure and action of the lower end of the oesophagus. The description of the muscular sphincteric mechanism is interesting. The conclusions are reinforced by deductions from various clinical observations, which are, however, often less convincing; they are usually unsupported by more than a personal statement of opinion. The detail of many of the photographs could be improved, and there is a startling absence of modern radiographs. It is also somewhat disconcerting to find no mention at all of Allison's observations and work on the cardiac mechanism.

It is certain that all interested in the oesophagus and pharynx should read this book, and most will wish to possess it.

R. C. BROCK.

FOR THE YOUNG SURGEON

Anatomy in Surgery. By Philip Thorek, M.D., F.A.C.S., F.I.C.S. (Pp. 970; 720 illustrations, 211 in colour, drawn by Carl T. Linden. £9.) Philadelphia and London: J. B. Lippincott Company.

There is a stage in the training of every surgeon when, having acquired a solid knowledge of human anatomy, he wishes to learn how this can be applied to the technical procedures of surgery. It is for the embryo surgeon at this stage that this volume is intended, and in spite of its cost he will find it a valuable investment. It is neither a textbook of anatomy nor of operative surgery, but it provides a bridge over the difficult region between the two.

As it covers the whole field of surgery it naturally cannot give all the technical details required for the actual performance of any operation, but it does give a very fair idea of even the most advanced surgical procedures and those of the most recent date, such as retropubic prostatectomy and excision of the oesophagus, showing clearly the anatomical problems involved and giving all the information that the student need require at this stage. Of some regions, however, a much fuller account is given, and the chapter on the surgery of the hand reaches a high level; it may well be instructive to the most expert surgeon.

The whole volume is finely produced, and profusely illustrated by one of the leading surgical artists in America. The drawings are devised and produced with equal skill and are a superb example of collaboration between surgeon and artist. To the teacher who wishes to present to his students modern surgical technique in a clear and accurate manner the volume will be invaluable. To the advanced student it should prove a sound introduction to the whole field of modern surgery.

HENRY SOUTTAR.

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GROWTH PROMOTERS

The existence of vitamin B_{12}, which is the name now given to a red-coloured cobalt compound present in animal protein and certain micro-organisms, appears to have been first realized in 1931 by Castle.[1] As the "extrinsic" factor necessary for the cure of pernicious anaemia it had to be provided in the diet and supplemented by supplies of the "intrinsic" factor, which the diseased stomach walls were unable to elaborate. Shortly afterwards Mapson[2] showed that liver, the outstanding source of the "extrinsic" factor, was also potent in promoting growth in rats. The substance responsible was different from all the vitamins then known, and was effective whether given directly to the young animals or to their mothers during lactation. It appeared to induce growth above the normal level and was given the name "physin."

These pioneer observations stimulated little progress for the next 15 years. During the past five years, however, rapid advances have led not only to the recognition that the anti-anaemic and growth-promoting principles are the same remarkable substance, but to the extension of the field of interest to microbiology and the antibiotics. Thus Rickes[3] in America and Lester Smith[4] in London have isolated Castle's "extrinsic factor" in the form of pure vitamin B_{12}, and clinicians have since shown that it is effective in the treatment of pernicious anaemia in very minute doses.[5] Mapson's physin has been rediscovered as the "animal protein factor" by American workers interested in rearing pigs and poultry on cheap vegetable diets. The study of its distribution, however, has been extended beyond liver, and fish meal and other animal foods have been found to promote growth. Of great significance was Bird's[6] observation that cows' dung may act as a source of the animal protein factor to chicks, since this finding was an important clue pointing to micro-organisms as the ultimate source of the factor. Eventually it was recognized that vitamin B_{12} prepared from liver could promote growth in animals receiving a vegetable diet, while conversely vitamin B_{12} isolated from materials previously studied as sources of the animal protein factor could cure pernicious anaemia. Culture media obtained as a by-product to the production of antibiotics replaced liver as the main commercial source of the vitamin, and the stage was set for another interesting advance.

In experiments with the crude fermentation products of *Streptomyces aureofaciens* Jukes and his colleagues[7] observed a higher growth-promoting power than could be explained by the concentration of vitamin B_{12}. Later he succeeded in isolating "aureomycin," and found that the growth-promoting activity of the crude product could be reproduced by the joint administration of this substance with vitamin B_{12}. In both pigs and poultry aureomycin substantially increased the growth rate, thus giving the antibiotics a new and unexpected part in aiding the efficient and cheap production of food. Penicillin and terramycin were also effective, and there have even been reports that under suitable circumstances sulphonamides may increase growth. It has been reported that in the U.S.A. the sale of antibiotics in food for farm animals is greater in quantity than the amount used in clinical medicine.

Cuthbertson[8] has recently commented on this important development and has suggested that growth stimulation in poultry by antibiotics may depend on both the basal diet and the microbial environment. The divergent reports from different workers suggest that antibiotics will be most effective in improving growth when the diet is deficient in animal protein or when the bacterial environment is unsuitable. That at least some types of bacteria are beneficial may be inferred from the success of the "deep litter" method, in which the birds' faeces are allowed to accumulate for prolonged periods in a thick layer of peat, or some similar material, and are kept at a temperature suitable for bacterial growth. Indirect effects—such as the accumulation of vitamin B_{12} in the flooring and the preventive effect of the heat and dryness caused by fermentation on the growth of parasites—may at least partially explain the success of this remarkable procedure.

The history of vitamin B_{12}, it will have been noticed, has gained interest from an exchange of clues between the medical specialist, interested in the cure of pernicious anaemia, and the agriculturist, interested in the cheap production of ham and eggs. The extension of interest to aureomycin has shown the same tendency, with the agriculturist both receiv-

1 Castle, W. B., Heath, C. W., and Strauss, M. B., *Amer. J. med. Sci.*, 1931, **182**, 741.
2 *Biochem. J.*, 1932, **26**, 970.
3 Rickes, E. L., *et al.*, *Science*, 1948, **107**, 396.
4 Lester Smith, E., and Parker, L. F. J., *Biochem. J.*, 1948, **43**, viii.
5 Ungley, C. C., *British Medical Journal*, 1949, **2**, 1370.
6 *J. biol. Chem.*, 1946, **163**, 387.
7 Ibid., 1949, **180**, 647.
8 Conference of Nutrition Society. See *British Medical Journal*, 1952, **1**, 161.
9 *Lancet*, 1952, **1**, 52.
10 Coates, M. E., *et al.*, *Biochem. J.*, 1951, **49**, lxvii.

ing information and repaying. If the antibiotic aureomycin is effective in increasing growth in animals, may it not have the same effect in humans? Controlled trials to answer this question have recently been reported by Robinson[9] from Israel. Studies were made of the progress of 11 sets of premature twins and two sets of premature triplets: 13 of the infants were given aureomycin by mouth for periods up to four weeks, and 15 were left undosed. The results appeared to be encouraging. All the treated infants survived, but five of the controls died: the average weight gain per day was 29 and 18 grammes respectively. Robinson has emphasized that these results may have been due to the antibacterial action of aureomycin rather than to a direct growth-promoting activity. The same question obviously remains to be answered about the stimulation of growth in farm animals. Antibiotics which are elaborated by organisms which also produce vitamin B_{12} will perhaps tend, when taken orally, to encourage the growth in the intestinal tract of organisms having metabolic habits similar to those from which they were derived. The administration of one metabolite, aureomycin, might therefore stimulate the production of another metabolite, in the form of vitamin B_{12}. Experiments by Coates[10] on calf dung, however, have shown that there are substances which have the potency of vitamin B_{12} when tested upon micro-organisms, but which are ineffective in promoting growth in chicks. Further research, therefore, is obviously necessary before the exact relationships between vitamin B_{12} and the antibiotics can be explained with reasonable confidence.

MEDICAL CERTIFICATION OF CAUSE OF DEATH

Despite the growing interest now being taken in statistics of non-fatal as well as fatal disease, the mortality statistics of this country have long been and will long continue to be an essential index of the health of the people. Mortality statistics provided incentives for the sanitary reforms of the nineteenth and early twentieth centuries and demonstrated the dramatic results of these reforms. More recently they have measured the results of spectacular advances in preventive and curative medicine, surgery, and obstetrics. They also indicate directions where progress has been disappointing, fields where more research or the fuller application of available knowledge is urgently needed, and on occasion draw attention to ominous trends of mortality requiring investigation and explanation.

The essential foundations of mortality statistics are the medical certificates of cause of death which practitioners are statutorily required to provide when their patients die. Half a million of these certificates are issued in this country every year, and upon them has been established the national system of mortality statistics that for over a century has served as an example to the rest of the world, bearing testimony to a long and fruitful collaboration between the Registrars-General and the medical profession.

The quality of mortality statistics can be no better than the quality of the death certificates on which they are based, and the completion of these certificates is sometimes a difficult task. The certifier has to make up his mind what was the cause of death—and this, particularly with the newborn and with the elderly, is often a complex diagnostic problem. He has also to decide whether to mention one or several causes on the certificate, and how best to present these causes and indicate their relative importance. In the London area in 1945 some two-thirds of a sample of death certificates were found to have mention of more than one cause of death, and on a sixth of the certificates at least three definite causes were stated.[1]

Since the beginning of 1950 the prescribed form of death certificate in England and Wales and Northern Ireland has been the international death certificate recommended by the World Health Organization for use by all countries where mortality statistics are compiled. To guide and instruct practitioners in the use of the international form of certificate (which, it should be noted, is not yet in use in Scotland) W.H.O. has published a small booklet[2] that describes the structure of the death certificate; explains the importance of recording the causes of death lucidly, concisely, and in correct order if the certifier's meaning is to be properly understood; and illustrates what is meant by direct, antecedent, underlying, and contributory causes of death and how they should be distinguished and recorded. The underlying cause of death, which is the one selected for statistical assignment, is the condition which initiated the train of events leading to death; in a properly completed certificate it would be the last or the only cause to be mentioned in part I of the form. The booklet also explains why certain terms are considered indefinite or inadequate and lists many of the descriptions that are found unsatisfactory and that lead to requests for clarification or for additional details.

1 *The Registrar-General's Statistical Review of England and Wales for the Six Years* 1940–1945. Text, Vol. 1, Medical, 1949, H.M.S.O., London.
2 "Medical Certification of Cause of Death." *Bull. World Hlth Org.*, 1952, suppl. 3.
3 Reprinted from *The Registrar-General's Statistical Review of England and Wales for the Six Years* 1940–1945. Text, Vol. 1, Medical, 1949, pp. 81–3, H.M.S.O., London.
4 *The Registrar-General's Statistical Review of England and Wales for the Two Years* 1946–1947. Text, Vol. 1, Medical, 1951, H.M.S.O., London.

The introduction of the international form of death certificate has caused little change in existing practice in England and Wales, where an almost identical certificate had already been in use since 1927, the only addition required in 1950 being the panel for the statement of duration of each of the conditions mentioned. Some remarks on defective death certification were sent to practitioners at the beginning of 1950,[3] and of course there are explanatory notes at the beginning of each book of certificates. Nevertheless the Registrar-General apparently finds it necessary to send out some 10,000 requests to doctors for supplementary information each year[4] in order that causes of death can be classified with sufficient precision to meet the increasingly detailed statistical needs of clinical, public health, and research workers. Many of these inquiries may be unnecessary if the information and suggestions contained in the W.H.O. booklet become better known and applied by certifying practitioners and are used in the training of medical students and newly qualified doctors. To furnish careful and accurate certificates of cause of death is an important responsibility of the medical profession, and it is the medical profession that is the principal user of the statistics derived from analysis of the certificates.

ECONOMICS AND DOCTORS

Before the end of the month the estimates of the cost of the Health Service in the coming year will be made known. This week a book[1] has been published which is an illuminating commentary on the cost of the Service, purporting to show why it has so grossly exceeded the original estimates. The book is by Dr. Frangcon Roberts, and it is written for laymen. Readers of this *Journal* will, in fact, be familiar with his views, some of which were expressed in an article as recently as February 9 (p. 324). But all doctors ought to read his stimulating and provocative book. They will be entertained and instructed.

Most doctors will agree with his diagnosis. The application of science to medicine has made investigations infinitely more elaborate and treatment more refined than 50 years ago. Pathological and *x*-ray examinations multiply; some of the new drugs have to be accompanied by complicated tests for weeks and months. This growing elaborateness of medicine is not, of course, confined to this country: in the United States it has gone even further. The Health Service cannot be blamed—and Dr. Roberts does not blame it—for this trend in medicine, which is the main reason why the estimates of the Service's cost were so wide of the mark. But he does blame the administrators who drew up the plans and estimated the cost for not having foreseen how the science of medicine would expand. And he is surely right in holding that now that the Health Service is well established we should take stock and reflect where the indefinite expansion of medicine will lead us.

We should be quite clear about how this trend in medicine has been affected by a health service paid for out of taxes. It may be argued that because the United States, for instance, devotes at least the same proportion of its national resources to the prevention and treatment of sickness as Great Britain, the fact that the country has a national health service is beside the point. The comparison, however, is invalid. The United States has a virile expanding economy and can afford to spend a larger proportion of its national income on health. Further, if Americans wish or have to spend a certain amount out of their personal incomes on treatment, they have that amount less to spend on other things. In Britain conditions are different. First, far too small a proportion of our resources is being saved and invested for the national economy to be able to expand progressively. Secondly, because people do not have to pay out of their own pockets when they use the Health Service they are not compelled to reduce their consumption of other things. The expanding trend of medicine is not checked by limits of personal finance. If it is contended that people's consumption is reduced by the taxation that pays for the Health Service the answer is to be found in the estimates of national income and expenditure in 1951 published last week. Even if allowance is made for higher prices the fact remains that last year the British people, by obtaining higher wages and salaries, increased their consumption more than they increased their production. The result has been the alarming deficit in the balance of payments and the threat to the pound. The place of the Health Service in the fight for national solvency is, therefore, plain. Dr. Roberts put it succinctly in his recent article: "If we want cortisone we must sell more coal."

Whatever they may have thought in 1946 when the Health Service Bill was introduced, few people to-day would disagree with his thesis that the proportion of the national resources allocated to the Health Service must be limited. But Dr. Roberts maintains that we must go further. The resources thus allocated, he argues, should be spent on a system of priorities, and the order of priority should be determined, not by direct individual happiness, but by the economic welfare of the community through which

[1] Ffrangcon Roberts, *The Cost of Health*, 1952, Turnstile Press, London.
[2] Winslow, C. E. A., *The Cost of Sickness and the Price of Health*, 1952, Geneva.

the happiness of the individual is indirectly affected. Thus he divides diseases into three groups: those which are not disabling, though perhaps causing individual distress; the disabling; and those in which treatment is humanitarian, prolonging life without effecting a cure and without enabling the patient to work. Dr. Roberts thinks that the resources of the Health Service may have to be concentrated on the second and third groups and treatment of the first group paid for privately. He realizes that his distinctions are not absolute, and he emphasizes that doctors have no concern with the economic value of their patients. Further, the logic of his argument can be seen more clearly if we consider an underdeveloped country with virtually no public health service. As the author of a recent monograph[2] from the World Health Organization points out, the authorities of such countries have a duty to spend their limited resources on preventive measures, on eradicating the mosquito and the tsetse fly, rather than on building hospitals for the immediate relief of suffering.

No one could accuse Dr. Roberts of hardness of heart, yet some readers of his book may feel that if his views were carried through to their logical conclusion doctors would be in danger of becoming merely the agents of a State medical service, whose main object was to get people back to work rather than to relieve suffering. Hard decisions about the allocation of resources would be left to the economic planners, and doctors would treat all their patients as best they could with the resources that were allowed them. As things are the profession has, of course, a duty to assist the Government in reducing unnecessary expenditure; but the first duty of the practising doctor must always be to the patient who seeks his advice.

PANTOTHENIC ACID

Pantothenic acid is one of the B vitamins that so far has found little clinical application. There is no convincing evidence that it is essential for human nutrition, although this has been assumed, since it is required by a number of species. It is widely distributed in foods; yeast, liver, kidney, wheat bran, and peas being the best sources. Most of it is bound with proteins or amino-acids through an amide linkage (–CO.NH–), which must be broken before the pantothenic acid can be utilized. Pantothenic acid is the prosthetic group or active part of a coenzyme concerned in acetylation known as coenzyme A, which is derived from pantothenic acid, adenosine, and phosphoric acid. It plays a part in the breakdown of fats and carbohydrates and the synthesis of fat from carbohydrate and protein.

Pantothenic acid is absorbed, stored, and excreted by man, and this is sometimes taken as evidence for its necessity in human nutrition. It may be, however, like some of the non-essential amino-acids, absorbed and excreted but not essential. Human excretion figures suggest that the daily requirement for man, if indeed it is required, is of the order of 10 mg.

The production in animals of nutritional achromotrichia, or greying of hair, by feeding on deficient diets, and its restoration to normal colour by administering pantothenic acid, led to the hope that the vitamin might be of value in the treatment of grey hair in man. There are two common fallacies here; one is that similar symptoms do not necessarily have a common cause; the other, that the findings from animal experimentation cannot necessarily be transferred to human conditions. It has never been shown that dietary deficiency is a factor in the production of grey hair in the ageing human, and reinvestigation of the earlier claims of some enthusiasts that pantothenic acid cures grey hair in man showed that they were completely unfounded. Nicholls[1] and Hughes,[2] however, believe that greying of hair can occur in malnourished children in the Tropics. Hughes found achromotrichia widespread among the poorly nourished children of Lagos, and he believes that a deficiency of pantothenic acid might be the cause, as the administration of the vitamin seemed to restore the normal colour.

The "burning feet" syndrome, although previously described in the literature on deficiency diseases, was recently seen among prisoners-of-war, particularly in Japanese camps. According to Gopalan[3] the injection of calcium pantothenate produced spectacular improvement in these cases. It is not clear whether a deficiency was being remedied or whether the vitamin was producing a pharmacodynamic effect.

As pantothenic acid is a component of the coenzyme for acetylation, it is therefore concerned in the formation of acetylcholine. One would therefore expect that a deficiency of pantothenic acid might result in a loss of parasympathetic tone. In the deficient rat atony and distension of the gastro-intestinal tract occur, the bowel becoming enormously distended, with loss of all peristaltic movements, effects which can be reversed by giving pantothenic acid.[4] Deficiency of pantothenic acid in the dog is characterized by increased gastric emptying time, pylorospasm, and intestinal hypomotility.[5] As the bowel changes in rats deficient in pantothenic acid bear a superficial resemblance to those seen in paralytic ileus in man, Jacques[6] treated 16 cases of ileus with pantothenic acid and claimed that from one to three injections of 50 mg. calcium pantothenate gave dramatic results within two to three hours. It would be of considerable interest if this work were to be confirmed. If it is, obviously the pantothenic acid is acting as a pharmacological agent. There is no reason to believe that human paralytic ileus is a result of pantothenic acid deficiency. The rationale for using pantothenic acid rests on the same fallacy as its use in the treatment of

1 *Lancet*, 1946, **2**, 201.
2 *British Medical Journal*, 1946, **2**, 85.
3 *Indian med. Gaz.*, 1946, **81**, 22.
4 Jürgens, R., and Pfaltz, H., *Z. Vitaminforsch.*, 1944, **3**, 243.
5 Martin, G. J., *et al.*, *Amer. J. digest. Dis.*, 1941, **8**, 290.
6 *Lancet*, 1951, **2**, 861.
7 *British Medical Journal*, 1951, **2**, 1224.

human grey hair—namely, that similar lesions in different species are due to the same cause.

Another effect that might have some clinical application has been reported by Munan and Einheber,[7] who state that calcium pantothenate in doses of 100 mg./kg. increases the survival rate of burned rats. This dose is one to two thousand times that normally needed by the rat. One possible explanation of the effect is that in the extensive metabolic changes of burn shock the concentration of coenzyme A in certain tissues becomes critical, thus increasing the requirement of pantothenic acid as an acetylating agent. It would be of interest to study the effect of pantothenic acid or calcium pantothenate on badly burned patients. Up to the present, however, it must be admitted that the vitamin has proved clinically to be something of a disappointment.

ON GIVING EVIDENCE

More often perhaps than most professional men, doctors find themselves in the witness-box in both civil and criminal courts giving evidence both of facts they have observed and of the conclusions to be drawn from those facts: they are usually at the same time witnesses of fact and expert witnesses. The court, not being expert in this sphere, cannot draw unaided conclusions on its own. To give expert evidence is a difficult thing: failure to give it well may have serious effects upon the administration of justice. Mr. A. C. C. Willway, the deputy chairman of Surrey Quarter Sessions, has recently described[1] what can happen, at any rate in prosecutions for being in charge of motor-cars while under the influence of drink, if the medical witness allows himself to be inarticulate or the victim of cross-examination. "By now," Mr. Willway writes, "the jury is completely bewildered and the average juryman probably says: 'Well, I don't think much of the doctor; I'd have been able to tell whether the accused had had too much to drink without all that rigmarole.' The result is acquittal irrespective of the weight of evidence."

Not alone among the arts, medicine speaks a technical language of its own which, unless translated, is largely unintelligible to most laymen and to most courts. The problem for the doctor is to express in terms understandable to the layman what he has found upon his clinical examination, and to explain in similar terms his reasons for his diagnosis and prognosis. The problem for the cross-examiner is to show that the evidence is not to be relied on either because the examination was inadequate or because the conclusions from it do not make sense. If the examination has been thoroughly made and explained in language the court can understand, and if in diagnosis art and common sense have gone hand in hand, the cross-examiner's task is thankless indeed.

It is often said that there are three kinds of liar: the plain liar, the damned liar, and the expert witness. The grain of truth embedded in this slander is that to give expert evidence well requires the exercise of one of the fundamental skills of the advocate. He has always to remember that the problem which is so familiar to him is quite new and unfamiliar to his audience. He should therefore explain it as he would explain it to a child. To reduce what is often a complex and difficult question to such simplicity calls for skill, patience, and clarity of thought as well as clarity of expression.

[1] *The Times*, February 11.

THE PETROL TAX

The general reaction to the Budget seems to have been a faint sigh of relief: the diagnosis was not quite so grave as had been feared and the treatment not quite so drastic. But once again doctors are faced with a rise in their expenses by the additional petrol tax of 7½d. a gallon. This means that a doctor doing 15,000 miles a year with a car that goes 25 miles to the gallon will have to find about another £20, though income-tax relief can be claimed for part of this. Trade and professional users of motor vehicles will no doubt pass this expense on to their clients, and Government-owned transport services will probably do the same. But doctors are not in this happy position, and the great majority of general practitioners especially will have a substantial addition to their expenses.

The B.M.A. has at various times tried, but without avail, to obtain direct relief for doctors from what has now become an exceedingly heavy tax. The previous Ministers of Health conceded that the effect of the petrol tax was bound to be reflected in higher practice expenses. Though the tax has been high for some time, the reason why no financial compensation for former increases was granted is that the Ministers insisted on awaiting the outcome of the dispute on remuneration generally, which is only now to be resolved by arbitration. But before agreeing to arbitration the profession obtained this assurance from the Ministry: "Following an award . . . practice expenses might thereafter be the subject of regular periodical review so that the allowance in respect of them can be adjusted in either direction as may be found appropriate." On the face of it this is an equitable assurance, but it will be useful only in so far as practical effect is given to it by adjusting the remuneration, though any adjustment made is unlikely to be retrospective to cover expenses already suffered. Even so, the agreement is an important one, and no doubt the General Medical Services Committee will soon be taking the matter up with the Ministry. In any case it is likely to be raised some time during the adjudication, which began on March 18. Other branches of the profession are also affected by the tax, and their representatives are considering how this burden may be mitigated. In particular many consultants are dissatisfied with their mileage rates, which will become even more inadequate in view of the additional tax.

A petrol tax is one that falls with peculiar severity on a small part of the nation—the medical profession. In that respect the tax is distinct, for doctors are singled out to pay it whatever their incomes and whatever their desires to buy this or that commodity: the illnesses of their patients dictate the expenditure, while the Government controls the doctors' ability to pay. It is therefore the Government's duty to see that they are not unjustly penalized.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

TENOSYNOVITIS AND TENDOVAGINITIS

BY

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Apart from suppurative inflammations of the sheaths of tendons, with which this paper does not deal, there are a variety of painful conditions which custom has loosely grouped together under the term "tenosynovitis." So vaguely is the word used that it has come to mean little more than a painful disability arising in or around a tendon or a group of tendons. The conditions giving rise to it are of uncertain pathology, and therefore more accurate terminology is hardly possible. The commonest, variously known as "non-suppurative tenosynovitis," "crepitant peritendinitis," or "non-specific tenosynovitis," can be quite disabling. It occurs most often in the region of the wrist, usually affecting the long extensor and abductor tendons of the thumb.

Tenosynovitis at the Wrist

In most cases such a tenosynovitis at the wrist starts fairly suddenly and often for no very obvious reason. The symptoms and signs are usually most marked over the radial side of the forearm just above the joint, where the tendons of the long extensor and of the abductor of the thumb come to lie on the radial side of the lower end of the forearm. All tendons which move either around corners or under ligaments are particularly susceptible to tenosynovitis. and on the radial side of the wrist the long thumb tendons cross over each other, and also move through a considerable range round a corner, in tough and unyielding sheaths. The occurrence of disorders caused or aggravated by friction is therefore very likely there.

Other tendons are not immune. The long flat tendons on the back of the hand move through loose areolar tissue (the paratenon), but they, too, have a considerable excursion and are liable to frictional troubles. In front of the wrist the flexor tendons are closely packed under the tight angular ligament, and move round a corner whenever the wrist is flexed or extended, so that they, too, are vulnerable.

It is hardly surprising that the commonest provoking cause of tenosynovitis is repeated unaccustomed movement, either an action the patient has never undertaken before or a familiar movement resumed after an interval. The type of action most likely to produce trouble at the wrist is a combination of gripping and of a twist of the forearm into pronation or supination, due as often to the use of scissors or shears as to the use of complicated hand-controls in machinery. The thumb tendons are especially affected by repeated full movements of the thumb and of the wrist together, as in picking up and laying bricks. The importance of newness of the action is seen in the fact that many patients start to have symptoms on the second day of taking up a new job or of resuming an old one after a holiday or an illness.

Occasionally the condition seems to be due to persistent repetition of some standardized movement which is neither new nor recently resumed, but which has been continued beyond the point of fatigue, especially after one particular strain which was of no great moment in itself. Tenosynovitis may occur in this way in the wrist of a golfer who has checked his stroke and gone on playing despite pain, or in the forearm of someone who has wrenched his flexor muscles in gripping the rail of a bus which has started suddenly. An isolated injury or strain alone, however, is not a sufficient cause, and many of these patients can give no history of anything likely even to have contributed to the cause of their trouble.

Tenosynovitis Elsewhere

After the wrist, the ankle region is the commonest site for the occurrence of tenosynovitis. Newcomers to treadle work develop it around the tendons of the tibialis anterior or tibialis posterior, in front of or behind the medial malleolus. Recruits to marching get a similar "peritendinitis" higher up the leg. The Achilles tendon is sometimes affected, though less often, but with this tendon great care is necessary. One must beware of the diagnosis of Achilles "tenosynovitis" if symptoms start after a single strain such as a badly taken jump, for such "strains" are often incomplete ruptures of the tendon itself, which, if neglected, become complete all too easily. The Achilles tendon is, however, almost the only one in which such gradual rupture can mimic tenosynovitis, except that tenosynovitis in the region of the shoulder is often associated with complete or incomplete rupture of the tendon concerned, but the syndromes produced around that joint are very different from those of the lesions under discussion here.

Symptoms and Signs

The clinical features of tenosynovitis such as we are now considering are pain, swelling, and crepitus. The condition occurs only in adults.

Pain is the earliest symptom. At first it is produced only by movement of the affected tendon or tendons, but later it can become almost continuous, very tiresome in bed, and so greatly aggravated by movement that reflex muscle spasm is produced and a subacute arthritis simulated. *Swelling* remains localized if the condition is affecting tendons with a definite sheath, such as those immediately in front of or behind the wrist and the ankle. Where it affects the peritendinous tissue of tendons which have no sheath, the swelling is diffuse. Higher up the forearm, on the back of the hand, and in front of the leg above the ankle one does not, therefore, expect localized swelling. *Crepitus* always occurs after the swelling, and is often best felt proximally to the true tendon sheath, rather above the swelling. This is to be expected, for the swelling is due to fluid, and where an appreciable amount of fluid has accumulated there is not much friction and therefore little crepitus. At the wrist the crepitus is described as "leathery," and over the Achilles tendon as "silky."

Prognosis

The course of tenosynovitis is a little unpredictable. In cases involving the long tendons of the thumb symptoms may last for weeks. In any case and at any site treatment is imperative, as there is a strong tendency for untreated or badly treated cases to become chronic, with acute exacerbations every time the patients resume work. Correct treatment can certainly prevent this.

Treatment

At the wrist, whichever tendons are affected, the aim of treatment is *restriction* of movement. *Abolition* of movement (absolute rest) is harmful, for muscle wasting and

weakness result from this and make relapse more likely when work is resumed. Moreover, complete immobilization of the wrist, the thumb, and the fingers all at the same time does more harm than is often realized, for the stiffness may persist many weeks after the splint has been removed, and the treatment thus becomes more crippling than the disease.

The degree of immobilization required can be obtained by the use of strapping, or, better still, of a detachable splint which is removed once a day for full active movements without strain. The splint must, of course, be a well-fitting one, preferably made of a light waterproof plastic material. It must be made specially for the particular patient under treatment. Alternatively, a removable plaster cast will do, or even a complete plaster if it does not include the digits. The wrist may be fixed, but the fingers must not be immobilized. Strapping, if used instead of a splint, is satisfactory if it is generously applied. A whole roll of 3-in. (7.6-cm.) elastic adhesive strapping is needed for each case. It should be applied from the knuckles up to a short way below the elbow, leaving the digits quite uncovered. At least six thicknesses should be applied over the area of the swelling, and the strapping should be changed as soon as it becomes loose. Generous firm bandaging over wool is also satisfactory.

It is as well for a sling to be worn for the first two or three days only. Then it must be discarded, and the hand should be used as much as possible, with the splint on, of course.

Massage plays no part in the treatment of this condition. Neither heat nor cold applied to the surface helps at all. Counter-irritants are equally useless, but there is perhaps something to be gained from the use of short-wave diathermy as well as splintage.

In patients whose tenosynovitis dates from taking up a new job, the importance of training is to be stressed. This is particularly true in young soldiers with peritendinitis in the anterior compartment of the leg, for the very fact that they complain at all indicates that their morale is low and that their need is training, not treatment. Most people regard such symptoms as a trivial and transient penalty for unwonted exercise in boots, a penalty paid, indeed, by most inferiorly trained amateur footballers after the first game of any season. The only persons who complain much are those who are using such symptoms to express their dissatisfaction with their conditions of life.

Chronic Tenosynovitis

A properly treated tenosynovitis should be cured in three weeks. If symptoms persist despite correct treatment, investigation is necessary. Chronic tenosynovitis may have a serious significance, though this is not usual. The swollen tendon sheaths in serious diseases such as rheumatoid arthritis and the tuberculous "compound palmar ganglion" are not likely to present as a simple tenosynovitis in the first instance, and confusion with serious disease very seldom arises. The association with rheumatic disease is, however, close enough for one to recommend the use of salicylates in any case of tenosynovitis which has no very obvious cause and which is resisting treatment. Authors of textbooks made much of the associations between tenosynovitis and allergy or gonorrhoea. These impress us less than they did our fathers, but the association with gout is more important and may call for consideration. Oxaluria also may be a factor maintaining chronicity in some cases. Syphilis as a cause of chronic tenosynovitis is certainly uncommon and is probably usually missed.

Most chronic cases start quite differently from the usual non-specific tenosynovitis, and they tend to produce a different end-result. In time they develop either a persistent distension of the tendon sheaths with fluid or a nodular or fibro-fatty enlargement of the sheaths. The first type of chronic disorder often gives the patient surprisingly little trouble.

Tuberculous Tenosynovitis.—The suspicion of tuberculosis can arise in any chronic case. Tuberculous tenosynovitis is, however, insidious and relatively painless in its onset. In contrast with the non-specific type we have been considering it favours flexors rather than extensors at the wrist, and, though extensors are not immune, the characteristic lesion of this disease is the compound palmar ganglion. At the ankle, tuberculosis favours the peroneals and the extensors of the toes rather than the tendons on the medial side of the joint. Tuberculosis of tendon sheaths is, of course, always blood-spread and an active focus is present and can often be found elsewhere in the body. The tendon-sheath disease usually produces enlargement of the regional lymph nodes by the time the patient seeks advice. Tuberculosis is, however, always a deceptive disease, and if real doubt exists it would be wise to make a biopsy of the lymph nodes or of the tendon sheath itself.

Tenosynovitis and Rheumatism.—Chronic tenosynovitis of the Achilles tendon, with swelling extending often visibly some distance up the tendon, is to be watched carefully. It is often an early indication of an otherwise unsuspected rheumatoid arthritis. Any nodular thickening beneath the tendon, in the region of the Achilles bursa, is especially suspect. The patient must be carefully questioned about swelling or pain in any other joint. Simple, non-rheumatic cases of tenosynovitis in this region respond well to elevation of the heel by ½ or ¾ in. (1.3 to 1.9 cm.), firm strapping of the affected area, and the removal of the stiffener from the back of the shoe, but, if the swelling persists despite this, a rheumatic background must be suspected.

Tendovaginitis: De Quervain's Disease

Tendovaginitis, in which the trouble lies in part at least in the fibrous tendon sheath and not in the inner synovial lining, is usually seen in one of two forms—as stenosing tendovaginitis or as trigger-finger or trigger-thumb. The first of these, stenosing tendovaginitis at the radial styloid (De Quervain's disease), is much commoner than is often thought. On the radial side of the wrist-joint, over the styloid process of the radius, two tendons lie in a shallow groove lateral to all the extensor tendons of the wrist and fingers. They are the tendons of abductor pollicis longus (extensor ossis metacarpi pollicis) and extensor pollicis brevis (extensor primi internodii pollicis). For 1¼ in. (3.1 cm.) over the lower end of the radius they are covered with a tough unyielding ligamentous sheath, from which they emerge at the level of the wrist-joint. The complicated movements which can be carried out simultaneously by the thumb and the wrist bend these tendons about to an unusual degree; it would appear that friction can produce at the same time a thickening of the tendon in the sheath, a reaction in the synovial lining, and a variable degree of thickening of the tough fibrous sheath itself, which becomes thickened as much internally as externally. A thick tendon in a thick sheath moves even less freely than ever, and pain is produced.

This condition, described by De Quervain, a pupil of the great Theodor Kocher, occurs only in adults. It is much commoner in women than in men. The pain may radiate widely, down the hand and up the arm, even to the shoulder. It is made worse by "straightening the thumb" (abducting the thumb) against any resistance, and especially by pulling the hand over to the ulnar side or by twisting the wrist so that the affected tendons are pulled at an angle to the sheath.

The one outstanding physical sign is localized tenderness just over the radial side of the lower end of the radius about ½ in. (1.3 cm.) above the tip of the styloid process. This tenderness is usually pathognomonic, for the only condition which could produce similar localized tenderness would be a fracture of the base of the radial styloid, when there would be a completely different history. Diagnosis is therefore easy, and it is usually made even easier by the presence of a palpable and often visible swelling due to thickening of the sheath (Fig. 1).

Treatment is as easy as diagnosis. If the tendon sheath is opened at the point of tenderness and slit open over its full length of about ½ or 1 in. (1.3 or 2.5 cm.), cure is certain. The amount of thickening in the sheath often surprises the operator, but once the sheath has been completely divided it opens enough to allow the tendons free movement and

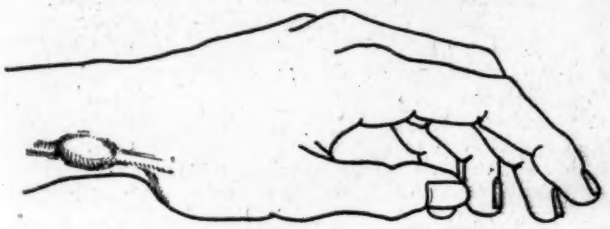


FIG. 1.—Stenosing tendovaginitis at the radial styloid (De Quervain). The drawing shows the position and the size of the swelling in a rather severe case.

plenty of room. The only things which can lead to a poor result are bad surgery or abnormal anatomy. The operation must be done under a general anaesthetic so that a pneumatic tourniquet may be used to give a bloodless field, for the surgeon can then make a precise job of what he is doing. He can certainly avoid the terminal branches of the radial nerve, which lie in the field and which can cause great pain if they are included in a stitch.

There is no reliable conservative treatment. Those who refuse operation can be cured by time, but it takes a long time. They are usually subjected to many weeks or months of plaster-of-Paris splintage or strapping, or both, but the credit for cure should be given to time. Operation, on the other hand, gives cure which is both immediate and certain.

Trigger-finger

Tendovaginitis over the palmar aspects of the metacarpal heads can produce a rather similar but much more dramatic syndrome—a "trigger-finger" or "trigger-thumb." This disability is due to a thickening of the tendon rather than of the sheath; the title "tendovaginitis" is really quite incorrect. Some swelling of the affected tendons is usual in the disorder at the radial styloid already described, but in the lesion found over the metacarpal heads the thickening is localized as a well-marked nodule which is big enough to get trapped in a practically normal tendon sheath. The nodule develops in one or both flexor tendons just where these tendons enter the finger. The powerful flexor muscles can usually pull it through the sheath quite easily, but when they relax it is found that the extensor mechanism is not strong enough to pull the nodule through the sheath in the reverse direction. This means that the finger stays flexed (Fig. 2) until considerable force is applied, usually with the other hand or by another person. A determined passive pull will be found to overcome resistance with a considerable snap, after which the finger extends fully and easily. The snap or click and the sudden free movement which follows it have earned the name "trigger-finger." In really severe cases flexion may be blocked in addition to extension, the finger being locked in a semiflexed position from which it can be moved only by passive force strong enough to produce the characteristic click.

FIG. 2.—Trigger-finger. The position in which the finger is locked.

FIG. 3.—Trigger-finger due to rupture of the extensor expansion. Note the very different position of locking from that in Fig. 2.

The only diagnostic difficulty lies in recognizing that the obstruction lies on the *palmar* side of the finger, anterior to the metacarpal head. The patient often insists that the click is on the back of the finger, and, as extension is the movement usually blocked, the doctor sometimes seeks for an explanation on the extensor side of the affected finger. This difficulty should not arise, for the nodular thickening of the flexor tendon produces a lump which can be felt very easily in the palm just proximal to the base of the finger.

There is one type of trigger-finger in which the lesion does lie on the back of the digit. This consists in an avulsion of the middle slip of the extensor expansion from the back of the base of the middle phalanx. This is much less common than the flexor tendon variety, it never affects the thumb, it follows a well-remembered injury, and it produces a completely different disability (Fig. 3). The sufferer from this lesion has difficulty in keeping the finger fully extended at the proximal interphalangeal joint, and when he flexes the finger (not when he extends it) there is a snap as the two lateral slips of the extensor expansion jerk sideways over the head of the proximal phalanx. There is, of course, no lump.

Trigger-thumb

Trigger-thumb is much commoner in infants than in adults. It is the only one of all these disabilities which ever occurs in children. The mother notices that the baby's thumb or thumbs cannot be extended beyond about 150 degrees without a pull, a jerk, and a click. Often the thumb cannot be flexed without a similar jerk. The thumb is held flexed into the palm, sometimes apparently completely locked, and the mother fears that the use of the thumb will be impaired for ever. The pathology is the same as in trigger-finger, and a considerable lump is always palpable in the flexor tendon of the thumb just in front of the first metacarpal head.

Treatment of Trigger-finger and Trigger-thumb

Again, the only reliable treatment is by a small operation which gives an immediate, certain, and permanent cure. The tendon sheath is exposed through a transverse skin incision (Fig. 4) in the line of the appropriate skin crease in the palm or at the base of the thumb. The exposed sheath is then slit longitudinally (preferably to one side of its midline), the nodule exposed (Fig. 5), the finger moved, and freedom of movement demonstrated. Only the skin should be sutured. This operation is better done under a local analgesic so that the patient can move the finger actively while the wound is open, thus demonstrating the completeness of cure or the need for further slitting of the sheath. In very small babies the operation may safely be postponed, but there is no reason why it should not be done before the second birthday. A local analgesic is hardly suitable for such patients, however.

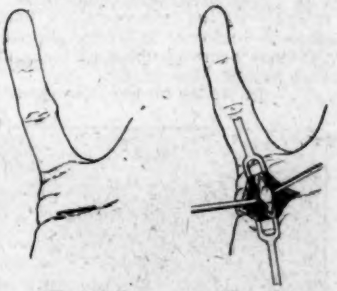


FIG. 4. FIG. 5.

FIG. 4.—Trigger-finger. The position of the skin incision for operative cure of a case involving the fifth finger. FIG. 5.—Findings at operation. Note the thickened nodule in the flexor tendon just anterior to the metacarpal head.

My thanks are due to Miss J. Perry for the diagrams.

Next Refresher Course Article.—"Empyema," by Mr. T. Holmes Sellors.

METABOLIC AND RADIO-ISOTOPE WORK AT UNIVERSITY COLLEGE HOSPITAL

The old children's ward at University College Hospital, London, W.C.1, has just been converted into a special ward for the study of metabolic disorders and the use of radio-isotopes in treatment. It includes in compact design two three-bedded rooms and two singles, a special diet kitchen, chemical laboratories for balance studies and for research, and a neatly planned isotope laboratory, with a "cellar" and observation-room, chiefly used for the treatment of histologically differentiated thyroid carcinoma, especially after thyroidectomy. Some views of this are shown below. The conversion has cost about £12,000, which the hospital has found from its special funds, with the help of a legacy of £5,000 from a former student, John Stothert.

FIG. 3.—Following the distribution of radio-iodine in the patient, while a Geiger counter is moved slowly over her on the rails, either by hand, or by a motor at a steady 10 cm. a minute.

FIG. 1.—Concentrated radio-iodide from Harwell, inside the lead cylinder by the operator's left hand, is diluted for the patient's dose by remotely controlled pipette (*left*) and burette (*right*), the operator wearing rubber gloves, and working at a distance of one foot behind lead bricks. Note the ventilation hood above, and the trolley on the railway at the back of the bench.

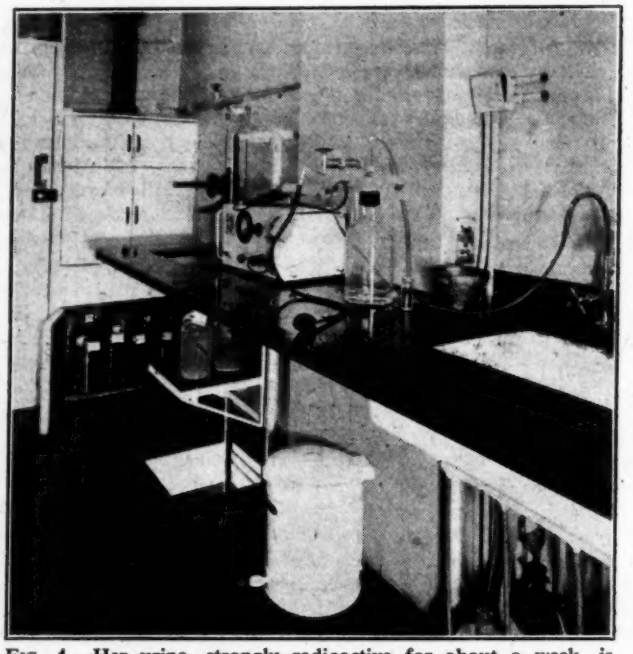


FIG. 4.—Her urine, strongly radioactive for about a week, is collected in her own Winchester kept in a lead-lined cupboard (*left*) with doors both into the laboratory and into the ward corridor. Filled bottles are moved with tongs to the lift, which takes them to the "cellar" below. Safe urine is poured down the funnel *left* of the sink, and runs into the tank in the cellar.

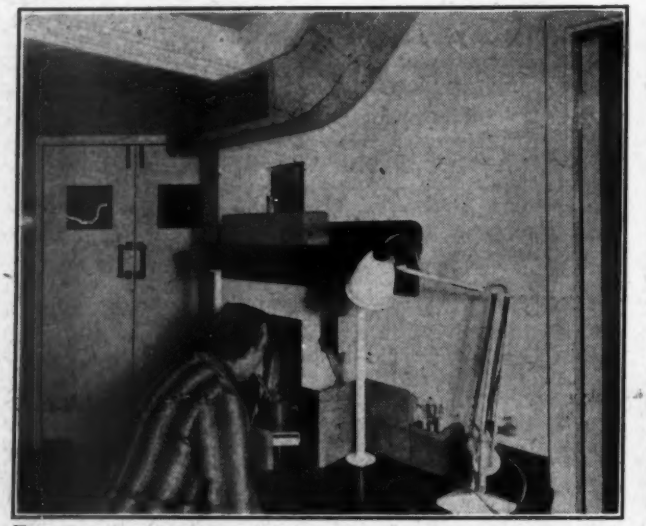


FIG. 2.—The patient sucks the dose of isotope from a flask inside a thick lead cylinder carried on the trolley of the remotely controlled railway. Note the protective lead bricks (some have been removed for the photograph) and the ventilation grille and shaft above the patient near the ceiling.

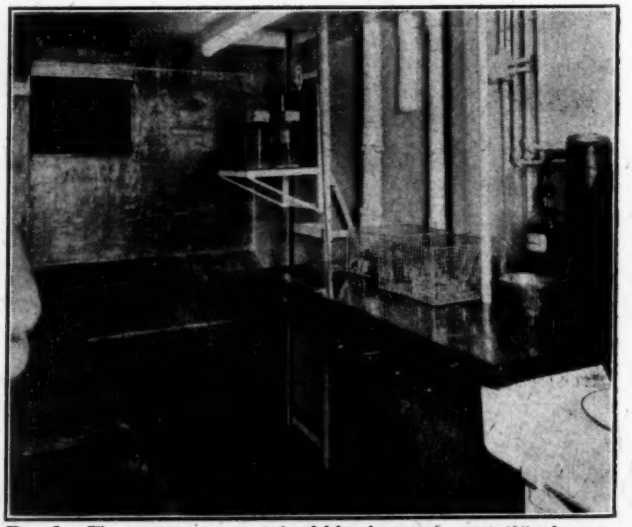


FIG. 5.—The cellar lined with lead bins in which some Winchesters of urine must be stored for two months, until their radioactivity has decayed to a safe level. They are then poured down the funnel let into the bench to the tank underneath, emptying slowly into the hospital sewage, with monitoring of the daily discharge.

EARLY TREATMENT OF POLIOMYELITIS

BY

G. P. MITCHELL, *M.C.*, M.B., F.R.C.S.Ed.

Late Resident Surgical Officer, Wingfield-Morris Orthopaedic Hospital, Oxford

(From the Nuffield Orthopaedic Centre, Oxford)

Poliomyelitis in this country did not assume epidemic proportions until 1947. Experience since then seems to indicate a greater endemicity than in the past, with a greater liability to seasonal epidemics in various areas.

To ensure good treatment and to obtain accurate information from a relatively small number of cases, it is essential that the care of the patients be delegated to a team composed of members from all branches of the profession interested in the condition. Such a team ensures an organization capable of expansion in the event of a large epidemic.

It is usually the custom in this country for acute poliomyelitis cases to be admitted initially to isolation hospitals and subsequently transferred to orthopaedic hospitals for treatment of the convalescent and chronic stages. Co-operation between the staffs of these hospitals is essential to a comprehensive plan of treatment.

Since 1947, in the Oxford area, the treatment of poliomyelitis has been so arranged that continuity is obtained from the onset of the disease through the isolation and orthopaedic hospital stage to the final assessment and treatment of the residual paralysis. It is the purpose of this paper to describe the present organization, and to emphasize several important points of treatment in the early stage.

Organization in the Oxford Area

In Oxford the aim is to bring together the staff of the fever hospitals and the Wingfield-Morris Orthopaedic Hospital, and at the same time enrol those from other branches of the profession with special experience or interest in the disease. The poliomyelitis team includes the M.O.H., the medical staff of the fever hospitals, a neurologist, and a specialist in virus diseases. The patients are admitted to the fever hospital. A member of the staff of the orthopaedic hospital is notified, and he visits the patient in consultation with the staff of the isolation hospital. After three weeks patients with severe residual paralysis are transferred to the orthopaedic hospital, while those with a minor degree of paralysis are discharged and arrangements made for their follow-up at orthopaedic clinics in the area.

A member of the staff of the orthopaedic hospital is responsible for the orthopaedic treatment from the onset, and he works in close co-operation with the medical and nursing staff, who actually carry out the treatment. In addition to arranging admission of paralytic cases to the long-stay hospital, the orthopaedic surgeon helps in the diagnosis of cases suffering from other complaints which are sent in as poliomyelitis during an epidemic; we have come across tuberculosis, osteomyelitis, "observation hips," and other orthopaedic conditions. The orthopaedic surgeon visiting the fever hospitals is responsible for ensuring that early deformities are mitigated, and he has recourse to other members of the team for advice when required. At the end of the poliomyelitis season he reports to the team on any problems encountered and brings forward suggestions for future epidemics.

Every year a demonstration of the respirator is arranged for nurses and housemen, and there are informal talks and discussions to which all members of the team are invited.

Treatment in the Fever Hospital

Apart from consideration of the infectious period, the three weeks' stay in the fever hospital which is customary at present is of the greatest value and should not be reduced. The patient has time to get over the painful irritable stage and can begin to adjust his mind to the future before being transferred to another hospital.

The psychological aspect of the disease is given special consideration by the fever hospital staff, medical and nursing, and even the orthopaedic surgeon can help by assuring the patient that an interest will be taken in resettling him when finally discharged. It is of the utmost importance that from the very onset of the disease the patient should be as relaxed and confident as possible in the circumstances. Patients obtain comfort in the knowledge that they are already being supervised by a member of the staff of the hospital in which they may spend a considerable time when the acute stage is past. This appreciation has often been expressed.

Such continuity is important with respirator patients, who are naturally disturbed by a change of hospital, and extra visits to such patients are well worth while, as the greater their confidence the easier it is to overcome the psychological difficulties associated with removing them from the respirator.

General Nursing Care

The patient in the acute stage is admitted to the fever hospital under the physician in charge, who carries out an approximate estimation of what muscles are affected. Extensive muscle-testing should not be done in the first few days. Problems of respiration, bulbar paralysis, urine retention, and general nursing are dealt with. Urine retention not responding to simple measures is treated by intermittent catheterization. In our patients no difficulty has been experienced in restoring bladder function in a few days, but in some cases bladder function may be abnormal for weeks or months.

The patient is nursed in a quiet cubicle, sedation by phenobarbitone is instituted, and codeine is given for pain. In the first few days the patient is often restless, and tends to change position frequently in order to gain relief from lumbar pain. In patients who cannot move, lumbar pain can sometimes be eased by placing a soft pillow under the lumbar spine for an hour at a time—if left longer the pain is apt to return. No elaborate positioning of affected limbs is attempted at this stage, apart from a foot-board and soft pillows supporting knees and arms. It is our aim to disturb the patient as little as possible.

Examination and Assessment

The orthopaedic surgeon is notified by telephone of the case and its approximate severity, and problems such as a tendency to overaction of a muscle group are reported. If there is any serious problem he visits the patient immediately, otherwise he waits until the fever has subsided and the patient is more co-operative. Young children should be visited early in the day, as they are unresponsive and difficult to assess when they are tired.

The patient is examined as fully as is necessary to obtain a reasonably comprehensive muscle chart, note being taken of any limitation of joint movement, neck stiffness, limitation of straight leg raising, and especially any tendency for a muscle to overact. On no account should a complete examination be made: minor errors in charting are preferable to the exhausting of muscles and patient. Muscle charts can be completed at subsequent examinations. After assessment, treatment is ordered.

Positioning and Passive Movement of Limbs

Limbs and spine are so positioned as to relax paralysed muscles and prevent the development of any overacting tendency in active muscles.

Spine.—If the bed and mattress are in good condition no fracture boards are used, as in some cases they aggravate the lumbar ache. The patient is allowed to roll on the side: frequent changes of position, and periods in the prone position, tend to ease back stiffness and pain in the early stage.

Lower Limbs.—The knees are supported by one pillow and the feet by a foot-board. When indicated, plaster back-

FIG. 1.—Method of suspension by felt sling from overhead beam. Use of bandage roll in maintaining thumb opposition is shown.

FIG. 2.—Improvisation of overhead beam using bed screen and cross-bar.

splints are used to control rotation or inequality of the leg muscles. The ankle is positioned according to the power of the muscles, but usually at a few degrees below the right angle, or more where there is gross weakness of the calf muscles.

Upper Limbs.—With paralysis above the elbow, the position is maintained by a broad felt sling under the elbow suspended from an overhead beam (Figs. 1 and 2). The shoulders are maintained at 75 degrees of abduction and the elbow at 90 degrees of flexion; the wrist and hand are placed in the position of rest at the outlet of the felt. The thumb is maintained in opposition either by a suitably placed opening in the felt or by a roll of bandage in the palm. This method is comfortable for the patient, maintains accurately any position required, and is easily altered when it is desired to change position. Passive movements can be carried out with the minimal disturbance. The slight flexion of the hand at the outlet of the felt prevents hyperextension deformity at the metacarpo-phalangeal joints and usually removes the need for additional splintage in the early stage.

Passive Joint Movement.—After the fever has subsided all joints are moved through a passive range twice daily, but the range must not be sufficient to cause pain or muscle resistance. Daily joint movement also ensures that early muscle resistance and tendency to deformity are reported to the orthopaedic surgeon at their onset.

Hot Packs

The over-zealous application of hot packs is exhausting to the patient mentally as well as physically. They are used only if there is persistent muscular tenderness or pain, and are applied to the painful areas and not to all the paralysed parts. Packs are renewed during a 20-minute period; this period is repeated according to the benefit obtained. Their use for a period just before sleep ensures a restful night. After the febrile stage children derive great comfort from immersion in an ordinary hot bath.

Summary and Conclusions

The organization which exists in Oxford for the treatment of poliomyelitis in the early stage is described. Co-operation between the staff of the fever hospitals and the orthopaedic centre ensures continual supervision of the patient through all stages of the disease.

Important aspects of treatment in the fever hospital are: general nursing care and sedation; examination and assessment; positioning and passive movement of limbs; hot packs.

The scheme of treatment described is designed to rest paralysed muscles and to prevent and overcome any tendency to early deformity likely to interfere with the patient's future activities.

This regime, when applied in the early stage of the disease, will usually overcome "muscle spasm" and consequent deforming tendencies by the time the patient leaves the fever hospital. When necessary the positioning should be continued after admission to the orthopaedic hospital.

Some patients have had little or no treatment in the early months of the disease, and in a proportion of these deformities due to abnormal overaction of muscle groups have been established. Deforming tendencies appearing in the early weeks of the disease must therefore be recognized and treated, and an attempt made to understand them.

At the Devon and Exeter Medico-Chirurgical Society on March 6 Dr. M. C. Binnie spoke of geriatrics, its scope and problems. He said that geriatrics should be regarded more as an outlook than as a specialty. Its outstanding contribution so far was its insistence on early activity. Contractures, bed-sores, incontinence, pulmonary emboli, and aspiration pneumonia were some of the sequelae of too prolonged a rest in bed. Cases of coronary thrombosis or congestive failure in the aged should be confined to bed for about half the time required by a younger person. Even before he got up much could be done for the elderly patient by simple physiotherapy. All who dealt with him should be encouraged to keep this principle of mobility constantly in mind. Next in importance came rehabilitation of body and mind. Occupational therapy, especially of a diversional type, could do much towards this end.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Anoxia in Sleep

SIR,—The anoxia found in deep sleep is not its cause, but the result of immobility, which slackens the circulation by removing the pumping action of the muscles which in activity reinforce the action of the heart.—I am, etc.,

Lowestoft. LEONARD HILL.

Coronary Disease in Doctors

SIR,—Lest the medical profession might be somewhat depressed by your leading article of March 8 (p. 535) showing the increasing incidence of early deaths in the profession from coronary thrombosis, we have analysed the ages at death of the 30 doctors in your obituary column (p. 557) of the same date. Of the 13 doctors whose ages are given, the average age at death was 76.7 years. Of the remaining 17, taking the date of qualification from the *Medical Register* and assuming that the average age to qualify was 22, the average age at death was 69.2 years, giving an overall average of 72.43 years, which goes to show that the doctor is still attaining his allotted span.—We are, etc.,

D. C. PIM.
Leeds. J. E. OUTHWAITE.

SIR,—In your leading article on coronary disease in doctors (March 8, p. 535) you draw attention to the apparent absence of any increased incidence of this complaint during the war years 1940–6, but that there *was* such an increase in 1947–50.

This seems to puzzle the investigators—but why should it? In a complaint of this nature there must be a considerable time-lag between the beginning of the disease and any manifestations.

I would say that the increase in 1947–50 is exactly what one would expect, the disease having originated during the war, with its abnormal stress and strain, three to five years previously to causing symptoms.—I am, etc.,

Bedford. F. K. HAYMAN.

SIR,—The figures and facts given by Dr. J. N. Morris and his colleagues (March 8, p. 503) confirm everyday medical experience that patients with coronary atheroma are liable to die suddenly, but one was not prepared to find that "60% of the total coronary mortality represented deaths occurring very quickly in the first few days *of the first clinical attack*." In my private practice, sudden death—i.e., death within 24 hours of a heart attack—occurred in 19 patients, and death within one week in another seven. The previous history was unknown in 4 of these 26 cases (five of them female); 12 had previous cardiac infarction, seven had angina with an abnormal cardiogram which, in most, showed cardiac infarction, and one had aortic stenosis. Sudden death without previous symptoms or signs of heart disease occurred in only two cases, and one of these had an abnormal cardiogram before onset of the fatal illness. These figures suggest that sudden death "in the first clinical attack" is exceptional. Cardiac infarction may come on slowly, and may take place with no more symptoms than mild indigestion, so that the diagnosis is made some time after infarction has occurred and no treatment is given. For this reason, eight of my patients were never off work for heart disease before they died. In actuarial records they died in the first clinical attack, in medical records they were known as patients with heart disease.—I am, etc.,

London, W.1. PETER MEYER.

Herpes Zoster and Varicella

SIR,—With regard to the concise study of herpes zoster varicellosus by Dr. D. I. McCallum (March 8, p. 520) I feel sure that the author had no doubt that a single virus accounted for the spectacular group of cases which followed Case 6.

Surely by now there is enough evidence for us to accept the view that zoster and varicella are due to a single virus which shows dermotropic and neurotropic modifications. In 1933 some of my cross-complement fixation reactions were so sharp and specific, while the controls were negative, that I had no doubt that the viruses were identical or very closely related. Many workers have confirmed these observations, and it is easy to explain the smaller group of negative findings by the variability in the amount of antigen present in the vesicles. Rake *et al.* (*J. Bact.*, 1948, **56**, 293) found that the elementary bodies of zoster were most plentiful in vesicles 12 hours after their eruption, while in 24 hours or later the elementary bodies were scanty. This fact, and the variability of dilution of the antigen which depends upon the amount of exudation, probably accounts for a good deal of the variability in the antigen content of the vesicles. Again, specific antibodies do not appear until about two weeks after the eruption, so that specimens of serum obtained earlier than this may give no reaction with the antigen. Amias and others have demonstrated the agglutination of virus particles from zoster vesicles with convalescent zoster or varicella sera. Rake *et al.* described an epidemic of varicella apparently initiated by a case of zoster, and stated the well-known fact that a vast number of similar cases have now been reported in the literature. These authors were able to demonstrate that typical and similar elementary bodies were found in the vesicles of the original case of zoster and in the secondary cases of varicella, and they conclude that one can hardly doubt that, in this instance, both diseases were produced by the same virus.

Is it surprising that occasionally the neurotropic modification of the common virus may be more stable and give rise to a small epidemic of zoster cases in contacts, when we remember the extremely stable modification of variola virus which we know as vaccinia? In my opinion the neurotropic and dermotropic modifications of the common virus of zoster and varicella account satisfactorily for all the known clinical phenomena, and I believe the acceptance of this established fact is overdue.—I am, etc.,

London, W.1. R. T. BRAIN.

Effect of Reading on Cataract

SIR,—Mr. Victor Purvis's letter (March 1, p. 490) raises an important question whether reading has any influence on the progress of cataract.

Doctors have an unenviable reputation for curtailing the activities of those who seek their aid. Restriction of close work, and, the mainstay of the optician, the frequent correction of refractive errors, have for long been held important in cataract and myopia: it is doubtful whether either has the slightest influence. To forbid reading in early cataract may well deny the only solace of the aged, and there is much to be said for the view that clerical work is the most suitable for the myope. One should be on sure ground before interfering with these occupations. It is surprising, therefore, to find (February 9, p. 318) one of Mr. John Foster's enlightened outlook maintaining this tradition, and it is a matter of concern that it should be in so widely read an article unless there is good evidence to support it. If so, let it at last be put before us.—I am, etc.,

Redruth. CHRISTOPHER HEATH.

The Anatomy Act

SIR,—It is pleasing to read the letter from the President of the Royal College of Surgeons of England (March 8, p. 544) commending the proposal to alter the law to authorize the establishment and maintenance of eye banks for corneal graft surgery.

For some time now we have been aware of the legal difficulties confronting ophthalmic surgeons wishing to collect and store donated material, and their dependence on the use of pathological eyes taken from living subjects. The provisions of the Anatomy Act place serious obstacles in the way of collecting material from persons who have just died, and I understand that unless the material is collected within a short time of the death of a patient it is valueless for use in ophthalmic surgery.

There are maintained in this country other banks of which the legality is seriously in doubt because of the restrictions imposed by the old Anatomy Act on the collection and storage of material for ready use in the treatment of bone and other conditions. From information I hold it is not unlikely that there will soon be a demand for the collection and storage of soft tissues—e.g., fascia, arteries, and veins.

The Anatomy Act was originally designed to meet a special set of circumstances arising from the activities of the "Resurrectionists." Their re-emergence is highly improbable, and the law should be suitably amended to permit surgeons and pathologists to collect material for treatment, for research, and for tuition in medical and postgraduate schools. The time appears to be appropriate not only for a minor change in the law but for a review of the Anatomy Act as a whole to eliminate its restrictions on treatment and pathological investigation, and to amend the provisions which may hinder surgical progress promised now or in the future.—I am, etc.,

London, W.C.1. ROBERT FORBES.

Bacteriological Warfare in Korea

SIR,—Many medical men and women must feel grave disquiet at the allegations by the Chinese Government that the U.S. armed forces have sent missiles containing disease-contaminated insects into the North Korean lines and into Chinese Manchuria; it is claimed that the diseases spread thereby include plague and that specimens of the containers can be produced. The accusations have been firmly denied, and it is natural for us in the West (though perhaps less easy for people in Asia) to accept this assurance and to assume that the allegations are a cover for spontaneous epidemics, etc. It is, however, freely admitted that research in biological warfare is proceeding (*Peace or Pestilence*, by T. Rosebury (New York, 1949)), and it is not impossible that the present situation might be regarded by some extremists as suitable for testing its potentialities. In the International Code of Medical Ethics adopted in 1949 by the Third General Assembly of the World Medical Association (of which the B.M.A. is a member), it is laid down that "under no circumstances is a doctor permitted to do anything that would weaken the physical or mental resistance of a human being, except from strictly therapeutic or prophylactic indications imposed in the interest of the patient." If such a pledge is to be more than a pious platitude we cannot be satisfied with denials, however much confidence we place in them, of accusations that medical research has been applied for grossly unethical purposes; the present grave allegations should be directly investigated on the spot by a neutral commission of inquiry. This is all the more vital because, in the broader aspect, this pattern of accusation, denial, and counter-accusation could be a dangerous precedent for the first use by any nation of any new weapon repulsive to public opinion. The situation also makes consideration urgently necessary of the plea of the Medical Association for the Prevention of War for international agreement on repudiation of the use of biological warfare as an offensive weapon, coupled with effective methods of control (*Lancet*, February 2, p. 258).—I am, etc.,

London, N.W.3. P. D'ARCY HART.

*** The International Red Cross offered on March 13 to send a neutral commission to Korea to investigate allegations of bacteriological warfare.—ED., *B.M.J.*

Experiment in Peacemaking

SIR,—I was much interested in the letter of Dr. R. L. Kitching (March 8, p. 548) in regard to the role that the medical profession can play in the maintenance of peace.

Throughout the Western and particularly in the Eastern worlds there are millions of people receptive to Stalinistic propaganda. These peoples are primarily receptive because of their living conditions.

Even allowing for every death, there will be 25 million more people by this time next year. Although 75% will die at an average age of 30, they will make the world population amount to 3 thousand million. With the assistance of chemotherapy, vaccines, and public health units, doctors are invading war-ravished and poorly developed countries, and producing unfortunate results. In Japan the death rate was cut by half, and then the birth rate jumped from 23 to 34 per thousand. In 20 years Japan's population will be over a hundred million. Similar figures can be cited for many other countries, such as India. Egypt, and certain islands, such as Puerto Rico. Instead of improving conditions, by increasing the birth rate and reducing the death rate they are continually deteriorating.

Some method of achieving control of the world population must be worked out soon. Recent experiments show that medical science will be able to produce some form of tablet contraceptive that can be used by the simplest people. It must be admitted the situation is complex, with many ethical and religious facets, but I feel it must be tackled if world peace is to have any permanency.

—I am, etc.,

Birmingham. R. SOMERVILLE LAMBIE.

SIR,—May I congratulate Dr. R. L. Kitching on his brilliant letters (December 1, 1951, p. 1337, and March 8, p. 548) concerning his suggested experiment in peacemaking and you for publishing them. What he has said is, I am convinced, what has been felt by the inarticulate millions who despair of the news in the daily papers. We are told that air raid sirens are to be provided in every town (but no shelters), so that presumably we are to be given a few moments in which to say our prayers before being blown into oblivion. It is insisted that war is not inevitable, yet our standard of living is being crippled to provide for it. Exhortations are made that we should join in civil defence "in case war comes," yet most of us have read John Hersey's book and know how futile the whole ghastly business will be. The statesmen on both sides argue and argue and never make any progress, whereas the people of every nation crave for peace and dread the shadow which creeps forward imperceptibly to darken their lives.

Surely it is time we recognized that there are national diseases as well as individual ones. Wars are national psychoses due to fear, and once the fear has reached sufficient pitch reason departs and delusional processes control all thinking. Part of this has already occurred, so that the word "peace" itself is suspect and anyone who belongs to an organization urging peace is already in danger of being put under surveillance. No doubt Dr. Kitching himself would find it difficult to gain entry into some countries because he has urged the need for peace.

Yet it is imperative, as Dr. Kitching states, that the people themselves should try to make contact with each other and dispel the fear of war which the politicians seem to breed and broadcast. It is this fear of war which makes such a large element in Italy and France become communistic. Surely we have sufficient to do to control disease without fighting each other. Let us therefore take up Dr. Kitching's suggestion to invite doctors of opposing nations to visit us, and raise a storm of protest if anyone dares to forbid their entry. If they will come, let us entertain them and discuss medical matters. Then they can go home and tell their nations that the people they met are human like themselves and not blood-stained monsters as they have been told. We may not have much success at first, but at least we shall have made a start. We shall not be like Anatole France's physician, who never interfered with the progress of a disease but found it of great interest to watch its progress until the patient died. In war we are the patient, but we may not find our own destruction so interesting.

—I am, etc.,

London, W.1. CLIFFORD ALLEN.

The Cleft in Man

SIR,—It is not often that the *British Medical Journal* bestows the hospitality of a full page of its valuable space on the review of a book (December 15, 1951, p. 1445). Impressed by this fact and by Professor Lancelot Hogben's interesting critique, in common no doubt with many others I have read the book, Dr. J. Bronowski's *The Common Sense of Science*, and would be glad to be allowed to comment on it.

In the last chapter Dr. Bronowski takes up the question of science the destroyer, and the indictments which have been brought against scientists for their alleged unthinking and amoral attitude as they go on inventing more and more destructive weapons. He remarks upon the fear of war that has developed, the war of nerves, and the important fact that there seems to be no generally accepted code of values capable of helping to deal with this situation. He offers a solution, however. He believes science can create these values, and states: "The first thing to do, it seems to me, is to treat this as a scientific question; by which I mean as a practical and sensible question, which deserves a factual approach and reasoned answer."

At this point his scientific training appears to desert him completely. He speaks of the cleft in man which two wars have uncovered—between the endeavour to be man and the relish in being brute—and, curiously to my mind, refers to it as a spiritual problem and not a psychological one. Later he asks: "Can science heal that neurotic [*sic*] flaw in us?" and adds that, if science cannot, then nothing can. And how will these very significant values be discovered and the cleft healed? The answer is: "Precisely as literature does, by looking into the human personality, by discovering what divides it and what cements it." That is how, he says, great writers have explored man in the past and that is how Dr. Bronowski believes this scientific problem, so important to us all, should be dealt with in the future. There is no suggestion that the problem may be a psychological one, and apparently a complete absence of awareness that a solution may be found through a scientific psychology or psychiatry. One is left pondering, after this incredible anticlimax with which the book ends, whether it is meant as an example of the common sense Dr. Bronowski is so interested in. As a psychiatrist, and after due consideration, I feel bound to say that it can be described more accurately in another way.—I am, etc.,

London, W.1. FREDERICK DILLON.

Laryngeal Epilepsy

SIR,—Dr. W. Raymond Parkes (September 15, 1951, p. 672) and Dr. Douglas K. Adams (December 1, 1951, p. 1340) suggest that this condition is more likely to be seen or heard of by the doctor than by the specialist. In more than 20 years of general practice I have not actually seen one attack, though I have been credibly informed of some twoscore or so. The name is unfortunate. I have not recognized the condition in an epileptic, though even if it occurred it would be mistaken by the patient for his usual fit. I prefer the name "laryngeal vertigo," or even "cough swoon."

We had a small epidemic of this condition in Bradford in the spring of 1940 or 1941. Those who suffered from it at that time have not shown any tendency to recurrence or indeed to any unfortunate sequel. Most winters bring a case or two. The typical case usually presents a rigid thoracic cage, good muscular development, an irritating cough, tenacious sticky sputum, and some degree of impatience. The sequence of events as I see it is that in the first place some respiratory discomfort sets off a cough reflex, which does not relieve the tickle. Now follows a series of rather futile expiratory efforts through a closed glottis, until the position of full expiration is reached. If a sudden inspiratory movement is now attempted while the glottis is tightly closed and possibly stuck together with gummy sputum the pulmonary circulation is bound to retain all the venous blood reaching it, until some sort of equilibrium is reached. The next stage is syncope, which almost at once causes relaxation of the laryngeal and inspiratory muscles, and the patient gets up from the floor or pavement convinced that his heart is bad. He is usually reassured when it is pointed out to him that a heart which will stand all this abuse and start working again must be a very good one to have.

It is interesting to notice that the swoon only happens when the patient is erect—probably because in that position the weight of the abdominal organs assists the sudden and violent inspiratory effort.

These attacks are rather rare and evanescent. It is most unlikely that any doctor will see many attacks, but I agree that students should be taught to recognize the condition from a description given by the patient.

At present I cannot find it mentioned in any of my books on medicine. Possibly the indexes are incomplete. My experience suggests that a cough swoon is more alarming than dangerous, unless of course it happens when the cougher is crossing a busy road. However, a patient of mine did even this with impunity once, but does not intend to tempt Providence again if he can help it.—I am, etc.,

Wrose, Shipley. HENRY STEWART RUSSELL.

Unsuspected Gangrenous Appendix

SIR,—I consider that the following case history is worth publishing because certain features are evident which give invaluable help not only to the average general practitioner but more especially to the newly qualified house-surgeon, who because of lack of experience may be apt to be unenlightened on the possibilities of some of these features.

The mother of a young girl aged 7 was worried about her child because she frequently became listless and ill-looking but without any other signs or symptoms except for a daily rise in temperature varying between 99° F. and 100° F. (37.2° C. and 37.8° C.).

This state of affairs continued for many weeks, during which time the patient was subjected to various tests. The Paul–Bunnell test was negative. The agglutination tests of the typhoid and paratyphoid group were negative. Lung fields were clear. The urine contained only a faint trace of protein as a possible abnormality. Blood count: W.B.C.s 11,000 per c.mm. (48% polymorphs, 47% lymphocytes, and 2% monocytes). The E.N.T. specialist could find no upper respiratory infection.

The child continued to be "off form" for some more weeks until I was called to see her because she had been vomiting and had a higher temperature. On examination she did not appear unduly ill. There was no localized area of tenderness or pain in the abdomen, which was doughy all over on palpation. Since a certain amount of influenzal gastritis was prevalent at the time this was considered a possibility and she was treated accordingly.

At the next visit 48 hours later she complained of more vomiting in the interval, with pain in the abdomen only with movement. Palpation gave some increased discomfort in the right inguinal fossa. The urine was pink in colour and very opaque. The temperature was 98° F. (36.7° C.) and the pulse 100 per minute. Her mother said that the temperature had been 101° F. (38.3° C.) in the morning.

She was transferred to hospital and later operated upon, and was found to have had a perforated gangrenous appendix with generalized peritonitis.

The points to be appreciated in this case are: (1) The signs and symptoms being negligible in comparison to the true state of affairs. (2) The possibility of a normal temperature and pulse co-existing with a gangrenous appendix. (3) The possibility of the red herring of the urinary system being thought culpable.

The patient at the moment is doing well. It will be most interesting to see if her previous spell of many months of pyrexia of unknown origin has at last ended.—I am, etc.,

Whalley, Lancs. C. E. BROWN.

Nature Cure

SIR,—An "Afternoon Argument" on Nature Cure between the Honorary Secretary of the British Naturopathic Association and a Fellow of the Royal College of Physicians was broadcast in "Woman's Hour" on January 31. I feel

rather alarmed about the affair and would like to suggest a different approach to the problem by our profession.

The F.R.C.P. representing our case did not understand his opponent. He found him living in a different world of ideas, and what he said sounded to him "too complicated, and at the same time too simple." When the naturopath emphasized that he treated the whole person—e.g., not pneumonia, but a person with pneumonia—that disease was a healing process, an effort of the vital force; that to assist this all-important intrinsic factor he used diet, fasting, cold water, and "osteopathy," but no drugs, the F.R.C.P. did not reply, but came straight back to pneumonia, stating that in this disease he treated only the extrinsic cause, the bacteria, stopping their growth with antibiotics.

The result was a draw. The listener was left with the impression that the B.N.A. had as good a case as the B.M.A., if not a better one, since it appeared that the scientifically trained mind was not able to penetrate into the metaphysical depths of naturopathic thought.

This is regrettable, because it is not true. Naturopathy, as a doctrine apart from, and opposed to, orthodox medicine, has no case at all. It has neither a theory nor a practice it can claim its own. Everything these lay healers have got they have borrowed from orthodox medicine 200 years ago. They are old-fashioned, while we are modern. That is the root of the matter. Because they are old-fashioned they appear, to a modern mind, to live in a different world; because they are old-fashioned they appeal to the public imbued with folklore. Medical folklore, too, goes back to ideas and methods taught by the medical schools 200–300 years ago. That accounts for the element of truth in them.

The concept of disease as a natural healing process, and of a vital principle governing the functions of the body, was introduced by the medical schools of the eighteenth century. This vitalistic trend of thought reigned over 100 years in orthodox medicine, long before the B.N.A. was born. Among its representatives were the great masters of our art, the men who laid the foundations of modern medicine. I am referring to the galaxy of Scottish thinkers, Robert Whytt, William Cullen, John Hunter, George Fordyce, Sir Gilbert Blane (*Elements of Medical Logick*, London, 1819), Sir Charles Bell, William Goodsir; the French vitalists, Sabatier, Bordeu, Barthez, Dumas, Bichat; and the German vitalists, Stahl, Gaub, Haller, Blumenbach, Reil, Hufeland, Joh. Mueller, Rud. Virchow. These men, in their lectures and writings, were full of praise for the *vis medicatrix naturae* which preserved the body from putrefaction, and they made wise use of its powers in their practice. They all were convinced "naturopaths," whether they prescribed diet, water, wine, laudanum, mercury, or bleeding. The saying, Feed a cold and starve a fever, goes back to Cullen, the most influential of these orthodox naturopaths.

Nowadays we do not talk openly about the good old *vis medicatrix naturae*, we take it for granted, which seems rather ungrateful. Every day the G.P., the surgeon, the obstetrician has reason to praise a power on which he relies so much. Nor do we talk any more of vital force or vital principle. We are afraid to do so because some of our professors have told us that vitalism is dead. But is it? As a matter of fact, we are quite unable to "explain" or express the true phenomena of life in physical or chemical terms. (Just try "Organization" or "Reorganization" for a start.) It seems that for this purpose the use of vitalistic notions of some sort is still unavoidable, as it was in Hunter's time when he demonstrated, by his famous experiment, the difference between a live egg and a dead egg. Why not admit it? We cannot define "inflammation" or "immunity" without reference to "defence" or "resistance" of the body; we cannot define malignant growth without referring to the "forces which control" normal growth. When a practitioner speaks of stimulation and sedation, does he not omit to add, "Of vital processes"?

In any case my colleagues will agree with me that so far as the cure of diseases is concerned we entirely depend on Nature. The labels "Nature-Cure" and "Naturopathy," therefore, are apt to mislead the public. We do not know of any other cures than cures performed with the help of the natural healing tendency or "power" of the organism. *Natura sanat, medicus curat*—with methods old and new. The question, Drugs or no drugs? does not arise at all. Drugs are always liberated and involved in the natural healing process, because every item of our diet and every part of our body is full of substances which, in their isolated state, are called "drugs."

We know of many different ways to treat a carbuncle—e.g., with diet or fast, with cold compresses or hot poultices, with cream cheese, mag. sulph. paste, or mercury ointment, with intramuscular injections of milk, or blood, or penicillin, with short waves or *x* rays. Whatever we do—so long as we refrain from "osteopathic" measures—we are assisting Nature's cure. How exactly our unspecific therapy and our specific therapy promote the natural defence process we do not know (though it would not be too difficult for our experimental pathologists to find out if their bacteriological preoccupation would permit such inquiries). But we know it is always Nature which initiates the inflammatory process we call carbuncle and brings about its resolution, including the destruction of the invading bacteria, in its own inimitable way. We doctors are Nature's humble servants, whatever we think or believe we are doing. The choice of remedies is mainly a matter of taste and fashion.

To sum up this argument in B.B.C. language: The "Naturopaths" have not got anything we have not got (and much improved) in orthodox medicine. Everything they can do, we can do better, safe, and quicker.—I am, etc.,

London, N.8. F. M. LEHMANN.

Cost of Anaesthetic Techniques

SIR,—Dr. C. P. Brown (March 8, p. 546) takes the flow rates suggested by me (February 16, p. 384) and postulates a patient with a minute volume of 5 l. and an oxygen consumption of 200 ml./min. and shows my oxygen flow to be inadequate. Both these figures might be high for a woman who had received "omnopon and scopolamine" and a total of 0.75–1 g. thiopentone as suggested by Dr. John Bullough in his original article (January 5, p. 28). In cases where Dr. Brown's figures do apply an increase of the oxygen and/or a decrease of nitrous oxide would meet the case. Minimal flow rates are not dangerous if the oxygen is adequate and the carbon-dioxide absorption is efficient. Dr. Bullough mentioned a technique for anaesthesia for a mastectomy involving a total flow of 8 l./min. I merely suggested equivalent figures on absorber technique, which were not intended as a guide to the beginner. I do not wish to draw a red herring across the path by suggesting the best anaesthesia for mastectomies, nor would I deny the very real value of T-piece technique in certain cases.

The only point of my letter was to discourage the development of techniques which involve blowing off large quantities of expensive gases into the atmosphere, and to that I could add the routine administration of costly antidotes to costly drugs. The hospitals have been run by the State for nearly four years now and no attempt has been made by the Ministry of Health to interfere with our clinical judgment in giving drugs. That trust should be respected by exercise of any reasonable economy which will not affect the welfare of our patients. We all pay in the end.—I am, etc.,

Northampton. F. F. WADDY.

Extensive Resection of the Small Intestine

SIR,—It is gratifying to see two further reports of successful massive resections of the small intestine with good nutritional follow-up results, and I should like to congratulate Mr. H. J. Croot (January 26, p. 195) on reporting them. It is a pity, however, that his review covers only cases reported before 1945, with one exception. There have been increasing numbers of reports of removal of massive amounts of small intestine within the last few years. Professor Linder and I have reported detailed metabolic studies in one case in particular (*S. Afr. J. clin. Sci.*, 1951, **2**, 71), with survival for over three years with only 6 in. (15 cm.) of small intestine remaining. Dr. W. Wilkie reported the surgical aspect of the case in 1950 (*S. Afr. med. J.*, **24**, 516). Another case of resection of over two-thirds of the small gut has also been reported by us (*S. Afr. J. clin. Sci.*, 1951, **2**, 205). These reports contained some of the more important recent references, and the record for small intestinal removal seems to be held by Shonyo and Jackson (*Arch. Surg., Chicago*, 1950, **61**, 123), whose patient was left with 4½ in. (11.3 cm.) of jejunum and ileum, but who died a year after operation.—I am, etc.,

Capetown. W. P. U. JACKSON.

Archetype and Schema

SIR,—Many people must have been grateful for both the fairness and the clarity of the leading article on Professor C. G. Jung's work (February 9, p. 314). Especially your remarks on the archetypes were helpful. They should greatly help the non-specialist to appreciate the depth and the empirical nature of Jung's work. As you stress, he is not systematic—i.e., not committed to dogma. Jung again and again stresses these points that should be obvious to anyone reading his works without bias.

In one of his latest books (*Aion*, Rascher, Zurich, 1951, p. 9) he says: "May the reader never forget that I make no confessions of creed or compose tendentious works, but consider how certain matters can be understood from the point of view of modern consciousness" (my translation). Jung is not a metaphysician, he is a physician predominantly interested in the psyche. He says elsewhere that the archetypes may have a cerebral basis. There are signs that we may learn more about that in the future. Sir W. Russell Brain has pointed out recently ("The Concept of the Schema in Neurology and Psychiatry," in *Perspectives in Neuropsychiatry*, H. K. Lewis, London, 1950, p. 139) that the "schema . . . is describable at the same time in both neurological and psychological terms. . . . The schema is a neurophysiological disposition which may or may not enter consciousness and which plays an essential part in perception and action, speech and thought. It is both physical and mental and . . . may prove to be the bridge between body and mind." I think Jung would have little objection if archetypes were regarded as the psychological side of such a neurophysiological disposition. Brain's and Jung's standpoints differ perhaps only by their emphasis.—I am, etc.,

Sedgefield. D. J. SALFIELD.

Epigastric Hernia and Dyspepsia

SIR,—I agree with Dr. Roy Houghton (January 26, p. 220) that epigastric hernia is a cause of dyspepsia far more common than one would suppose from the casual and inadequate description given in most textbooks, but I doubt whether his explanation of the apparent connexion between this condition and emphysema is the true one.

Some years ago in an ordinary industrial practice I collected notes of 12 cases of epigastric hernia I saw in as many months, and since then, always on the lookout for them, have seen probably four or five a year. Of the 12 the youngest was a boy of 4, the oldest a woman of 80, with males predominating in the intervening ages. The herniae varied in size from as large as half a walnut to as small as an orange pip, most being small.

I believe that in most cases the prime cause is a tiny congenital defect in the interlacing fibres of the linea alba, perhaps at a point where a blood vessel traverses the layer. This defect, yielding before intra-abdominal pressure, enlarges until a sac of peritoneum herniates through; thereafter the opening gradually becomes circular and its edges fibrose, thus limiting further enlargement, the sac meanwhile having become occupied by a small tag of omentum or, more rarely, a small knuckle of intestine. In some patients the hernia will appear spontaneously, in others only when assisted by acute or chronic muscle strains—e.g., coughing.

Not all herniae produce trouble—I have a boy of 7 under my care who has two with no symptoms. When they do occur, symptoms follow a fairly constant pattern and are easily mistaken for those of gastric ulcer—I have seen two patients so misdiagnosed by well-known consultants. The patient complains of sharp epigastric pain during or immediately after a meal, fullness, nausea, and sometimes vomiting, which relieves the pain.

On examination, unless these lesions are specially looked for, they may be missed, particularly in fat patients. Some herniae are very small, may be invisible with the patient lying down (probably seen, however, with the patient standing and coughing), and are not always felt by flat-hand palpation. If the pulp of the middle finger is drawn with gentle pressure along the line between xiphisternum and navel the unseen hernia will be encountered as a hard pea-like nodule, almost certainly tender, which will usually disappear on firm pressure with a characteristic palpable gurgle, leaving the finger holed and resting on the ring-like edges of the hernial opening. The patient in pain is immediately and dramatically relieved by this reduction. If the sac is not protruding at the time of examination the finger method will usually detect the hole—and a cough impulse may then be elicited.

Radical cure is by operation. The fibrotic rim of the opening in the aponeurosis is elliptically excised, the sac is transfixed, and if large enough excised, the edges of the ellipse sutured with good overlap. A belt with a pad to fit over the hernia will usually give satisfactory relief to those unfit for or refusing operation.—I am, etc.,

Horsham. F. TAYLOR.

Hazards of Manipulation

SIR,—Mr. Robert Hafner is to be congratulated on his clear and precise account of the dangers of manipulation of protruded lumbo-sacral intervertebral disks (February 16, p. 361). In a recent series of 150 cases of disk syndrome I had three who had an exacerbation of pain following manipulation under anaesthetic. In each case the pain was of great severity and lasted 24–72 hours before gradual amelioration occurred with absolute rest.

What Mr. Hafner does not make clear, and it is an important omission, is that he refers to the usual indiscriminate manipulation under an anaesthetic. His patient was partially anaesthetized, and his accurate description of the onset of pain shows that it was spinal *flexion* which did the eventual damage. This movement is never used in the recognized technique of lumbar manipulation without anaesthetic (Cyriax, J., *Textbook of Orthopaedic Medicine*, vol. 2, 1950), and as a consequence the complication of severe exacerbation is unknown with this form of treatment. It is therefore most important to distinguish between the two methods.—I am, etc.,

London, S.W.3. JOHN EBBETTS.

Referred Backache

SIR,—It was a great pleasure to me to read Professor Hugh C. McLaren's paper (February 16, p. 347), in particular to see it authoritatively stated that post-natal cervical erosion does not cause backache. For decades women with backache, largely because they complain that the lumbar pain is more severe at period times, have been thought to harbour a pelvic cause for their symptom. In fact, during menstruation, pain referred to the back from the uterus is superimposed on the backache arising from the back. These two pains, felt in the same place, summate. One has only to remember how often men suffer from backache to realize that backache in women, no less than in men, usually originates from the moving parts of the back.

I should like to commend a simple preliminary test to be performed whenever the question arises of the provenance of a woman's backache. She stands, and bends her trunk forwards, backwards, sideways each way, and twists each way as far as she can. If one or more of these movements hurt at the extreme or there is a painful arc, a lesion exists of the moving parts of the back. If no movement hurts, pain referred to the back from elsewhere is present.—I am, etc.,

London, W.1. JAMES CYRIAX.

Carcinoma of Adrenal Cortex

SIR,—The article by Drs. R. J. Harrison and Denis Abelson (February 9, p. 303) has prompted my memory of a case seen at Western District Hospital, Glasgow, while resident physician.

An elderly man, of very dark complexion, cachectic to some degree, with slight buccal pigmentation, normal blood pressure of about 140/90, and marked asthenia, did not give a good history, but was suspected of having a high gastric carcinoma.

He died following haematemesis, and at necropsy was found to have what appeared to be a carcinoma of the lower oeso-

phagus, the source of haemorrhage. He also had bilateral enlargement and caseation of the adrenal glands. Histology, however, suggested carcinoma of the suprarenal cortex, with lymphatic spread to the oesophagus. The patient also had bilateral silicosis and caseating tuberculosis.

Except for the normal blood pressure the patient had an Addisonian-like appearance, and this is of interest, considering the involvement of the adrenal cortex.—I am, etc.,

Glasgow. GILMOUR HARRIS.

Educating the Public about Cancer

SIR,—I have read with great interest Dr. N. E. McKinnon's pessimistic letter (March 8, p. 544) and his article in *Surgery, Gynecology and Obstetrics*, February, 1952 (p. 173).

Nearly everybody realizes that prognosis in cancer depends very largely on the degree of differentiation and power of the tumour to metastasize. I say nearly everybody, because some people still seem surprised to find that patients with a well-differentiated tumour can be "cured" in spite of delay in diagnosis and seem to forget that those which are undifferentiated may become inoperable in the same space of time. Dr. McKinnon, however, seems to assume that tumours can be classified into:

(*a*) those that are so undifferentiated and metastasize so soon that early diagnosis is impossible, or
(*b*) those that are so well differentiated that early diagnosis is unnecessary.

The evidence for such an assumption which he gives in his article quoted is not convincing. Surely experience, and indeed some experiments with corneal transplants, suggest that there are all degrees of differentiation, and even that some tumours may become less differentiated in the course of time. It is in such cases as these that early diagnosis will help.

In the case of cancer of the cervix uteri, Heyman's *Report* (Vol. VI), which includes records of 41,046 patients, shows that, between the publication of Volume IV in 1941 and Volume VI in 1949, the percentage of stage I and II cases has increased with a corresponding increase in the percentage of the five-year survival rate without symptoms or signs. This increase for *all* cases treated is shown to be 5.1%, and of this improvement Heyman suggests that 3.2% is due to the "quality of the material" and 1.7% due to improved treatment.

Dr. McKinnon in his article (*Surg. Gynec. Obstet.*) states that there has been no material reduction in cancer mortality during the last 20 to 30 years due to earlier or different treatment. If this is so, Nature is being kind and providing more differentiated tumours.

It is true that there is not nearly enough evidence to correlate time of diagnosis, stage of the disease, and the type of the tumour, and it is hoped that a critical experiment under the guidance of statisticians at every stage of the experiment will be undertaken in this country as soon as possible.—I am, etc.,

London, W.14. M. DONALDSON.

SIR,—Recent letters in the *British Medical Journal* have shown a pessimistic attitude towards the early treatment of breast cancer. It is advisable that the arguments adduced should be refuted.

The belief of the medical profession is that a certain number of cases of breast cancer, if seen early and radically treated, are cured; some are not cured but remain free from signs of "recurrence" for long periods, even up to nine or ten years of useful life. Unfortunately, others are very soon in a hopeless condition.

Dr. N. E. McKinnon (March 8, p. 544) bases his attack on these beliefs entirely on statistical evidence that the mortality rates from breast cancer remain unchanged, in spite of propaganda and early treatment. But he is dealing with two variables: one, the incidence of breast cancer in the female population; the other, the number of cases that get early and adequate treatment. If (as seems likely in an ageing population) the incidence of breast cancer is increasing, and concurrently the proportion of those who get early treatment by modern surgery and radiation with good results has also increased, then the mortality rates would not show much change.

The rather rare atrophic breast cancer can remain free from metastases, but is usually fatal in the end. However, Dr. McKinnon summarily dismisses all the (admittedly) large number of breast cancers that do well after treatment as belonging to a non-lethal and non-metastatic variety of cancer. Surely such an assertion would require evidence from the pathologists. If there is no evidence at all, we can continue in the more sensible and comforting belief that the fortunate women who do well have done so as the result of good treatment.—I am, etc.,

Hastings. HARRY GABB.

SIR,—Dr. N. E. McKinnon's letter to you on this subject (March 8, p. 544) does not appear to be helpful in the campaign against cancer. Whatever may be the statistical facts about breast cancer, the same does not apply to cancer in other parts of the body, especially the larynx and deep pharynx. It has been my painful experience over the last six years to see at least 10 cases of carcinoma in the cricoid region too far advanced for successful treatment. The causes are many, among which are fear on the part of the public of this disease, and their ignorance of the result of treatment. May I add that I disagree with the quoted words of Dr. James F. Brailsford: on the contrary, we have something solid to offer, and it should not be done quietly.—I am, etc.,

Liverpool. JOHN MCFARLAND.

Sexual Disorders in Women

SIR,—I do not agree with Dr. Joan Malleson (February 23, p. 437) that some women have their erotic sensation limited to the cervix. Deep penetration by touch and pressure will undoubtedly give rise to sensation in the pelvis interpreted by some women as an added emotional factor to the joy of sexual intercourse and by other women as dyspareunia. Even if erotic sensation were present in the cervix, it is doubtful whether the thin rubber of the occlusive cap could prevent stimulation of the cervix by the thrusting penis. It is true, however, that discarding the cap does occasionally lead to complete orgasm, but many years of experience of sexual disorders and contraception have convinced me that the basis of this is emotional. The lowest part of the anterior vaginal wall is of course erotic, because stimulation here is directly on the tissues of the vestibule and round the urethral orifice. The penetrating penis produces erotic sensations by friction at the upper two-thirds of the vaginal introitus, having practically direct contact with the tissues under discussion. A well-fitting cap cannot interfere with this contact except, as always, for psychogenic reasons, and once again discarding the cap does in a small percentage of women help to relieve varying types of emotional tension and may allow orgasm.—I am, etc.,

London, W.1. PHILIP M. BLOOM.

Male Infertility

SIR,—Your leading article (December 22, 1951, p. 1507) drew attention to work by Nelson and others, who have shown that big daily doses of testosterone given to men with defective spermatogenesis cause further inhibition of spermatogenesis. But if the testes are examined a year or two after treatment there is a regeneration of the seminiferous tubules and a normal sperm picture, in contrast to the defective spermatogenesis present before injection.

This result was interpreted as meaning that the testosterone originally suppressed the pituitary gonadotrophic hormone, but that a subsequent rebound effect occurred, stimulating the production of gonadotrophic hormone.

In 1938 I published a paper (*Lancet*, 1938, **2**, 1457) describing a comparable phenomenon. I showed that injection of large

doses of oestrogen in human beings produced a decrease in urinary output, followed by a polyuria on stopping injections. This polyuria was more than could be accounted for by a mere release of retained fluid and was interpreted as being due to a depression followed by stimulation of the anterior lobe of the pituitary gland.

In 1939 Bishop and I reported (*Guy's Hospital Reports*, 1939, **89**, 240) a case of Cushing's syndrome in which the patient found it necessary to shave every fourth day. On 10 mg. oestradiol benzoate daily by injection she required to shave only every eighth day, but on cessation of injections she had to shave every other day. This retardation and subsequent acceleration of hair growth were observed more than once in the patient. This phenomenon was interpreted as being due to depression followed by stimulation of the anterior pituitary adrenocorticotrophic hormone.

A study of the literature revealed that Clauberg and Breiphol (*Klin. Wschr.*, 1935, **14**, 119) had described a similar pituitary release effect in connexion with gonadotrophic hormone production in rats. Evidence is thus accumulating of a method of stimulating the production of pituitary trophic hormones. Apart from this technique I know of no other method of stimulating the pituitary to increased production of its hormones.

For some years I have used this principle in the treatment of impotence in the menopausal male. Instead of giving small doses of testosterone such as 10 mg. three times a week, I have used 25 mg. daily for ten days and then stopped. I have done this on the assumption that while used as replacement therapy this dosage inhibits the production of gonadotrophic hormone, but that on cessation of injection gonadotrophic hormone production is stimulated. My cases have been too few, and the results so complicated by the possible purely psychological benefits, that it would be unscientific to draw any conclusions. Perhaps some clinic with more facilities and a large number of cases might compare this method with a control series injected with some placebo.

Finally, it seems quite probable that a similar stimulation of A.C.T.H. production should be obtainable by giving a sufficiently large dose of cortisone for a sufficiently long time first to depress but subsequently to stimulate A.C.T.H. production.—I am, etc.,

Capetown, South Africa. B. G. SHAPIRO.

The Place for Voluntary Work

SIR,—In your leading article (February 16, p. 367) you make or repeat statements which seem to be of doubtful accuracy in regard to fact or philosophy (unless of course one accepts that of Karl Marx). Thus you say:

(1) "It is often forgotten that the Health Service has grown from voluntary work and the efforts of charity."

(2) You repeat without comment that "to many social reformers charity has a suspicious and unpleasant sound," and you speak of "replacing the inadequate haphazard . . . patronage of the poor . . . by granting the right to all *citizens* equally to obtain aid from an impersonal State."

(3) "Man is a social animal, which means . . . he has the instinct to work with and to aid his fellows."

Will you allow me to comment in reverse order on these statements, though they are all connected by the same thought—namely, that the root cause of the malaise of N.H.S. must be sought for in its basic philosophy, otherwise any proposed remedies will be only symptomatic treatment.

In regard to (3) it is a fact of history that the Church in England (*Ecclesia quod est in Anglia*, of Magna Carta) founded our first hospitals and shaped our civilization, and I suggest it is nearer the truth to say that the urge to voluntary service derives from the still deeply rooted influence of its teaching—i.e., that it originates not from the *Jungle Book* or *Das Kapital*, but from applied Christian philosophy, as taught for centuries by the Church. This philosophy included a belief that man (and it still holds good for *Homo sapiens*) is partly physical, partly metaphysical in his being, and that in consequence he is subject to both physical and spiritual laws. He cannot invent these laws, he can only discover them. If he breaks any of either category, he becomes ill, physically, mentally, or morally—e.g., the present feeling of frustration.

(2) My comment on this is that the organizers of every revolution play upon real or imaginary grievances; and I hope you will make it clear that you do not concur in these opinions so far as the now dead voluntary hospitals are concerned. It is pure Communist propaganda—cf. Marx: "To each according to his need; from each according to his ability."

(1) To describe the replacement of the voluntary service by the National Health Service as a process of natural growth is just nonsense, except in the sense that a neoplasm grows out of the body.

The voluntary system, I believe, grew out of the Christian philosophy and tradition. The National Health Service constituted, according to the politicians, an essential part of a social revolution. A revolution is a complete break with tradition and the founding of new institutions based upon a totally different philosophy, in this case the replacement of a system based on Christian philosophy by one based upon that of Karl Marx. The former produced self-reliance and taught free men to give voluntary service. The social effect of the latter is illustrated in the current phrase, "What can I get out of the State?" I think myself that it is optimistic to hope that this moral rot can be cured except by a radical change of philosophy.—I am, etc.,

Bournemouth. DAVID HARDIE.

Pseudocyesis

SIR,—With reference to your interesting annotation on pseudocyesis (March 8, p. 538) an experience I had with a Scottie bitch some years ago may be of interest.

This animal came into season normally, and was mated to a good stud dog. She developed the usual signs of pregnancy, although we were never quite sure of the puppy movements, and began to whelp on the appropriate day.

We were expecting a difficult delivery, so I sat with her for the whole four hours of her labour, during which she pushed and heaved amazingly, with the production of nothing but a little mucus.

At the end of this time her activities died away leaving us both tired and fed-up and the bitch her former slim self. I went to a neighbouring kennel where I had a spaniel bitch with an overlarge litter, and brought the Scottie two day-old pups, which she brought up beautifully.

Now there was no evidence that the Scottie had a mental conflict soluble by pregnancy. I have always thought that the whole process was set in motion by her mating. Is this evidence that there may be a similar physiological process occurring in women as a result of intercourse? How frequently does pseudocyesis occur in celibate women?—I am, etc.,

London, S.E.27. EDITH M. W. ELLIOTT.

Attempted Suicide

SIR,—Dr. P. Jacobs's letter on this subject (March 1, p. 490) has only just come to my notice. In case junior hospital residents, and others, may be misled by Dr. Jacobs's advice that they should act as police informers in cases of attempted suicide or suspected foul play under their care I must contradict his opinion.

A doctor's duty begins and ends with the treatment of the medical condition from which his patient is suffering, and, provided he carries out this treatment to the best of his ability and in the interests of the patient, he has fulfilled his responsibility. Whatever some coroners may say, informing the police of an attempted suicide or of a case of suspected crime is not part of the treatment of the patient nor is it in the medical interest of that patient. Clearly, if it became known that medical practitioners acted as police informers or in other ways disclosed medical secrets it would at once prove an effective bar to seeking medical aid to some in great need of it. Professional secrecy must be maintained. It is basically inherent in the confidence with which the public approaches the medical profession. Any temptation to depart from this rule for purposes of expediency in a particular case (such as calling the police to watch at the bedside), or because of a fear of being blamed by some authority, must be resisted as being beyond medical duty and contrary to the public interest.—I am, etc.,

JOHN THWAITES,
Chairman, Central Ethical Committee.

Obituary

G. W. M. FINDLAY, C.B.E., M.D., D.Sc., F.R.C.P.

We announce with great regret the sudden death of Dr. G. W. M. Findlay on March 14. He had been editor of *Abstracts of World Medicine* and *Abstracts of World Surgery, Obstetrics and Gynaecology* since 1946 and was well known for his research work on yellow fever and other virus diseases.

George William Marshall Findlay was born on January 6, 1893, the son of Dr. George Findlay, of Brailes, Warwickshire. From Dean Close School he went to Edinburgh University, where he was in his final year as a medical student when the first world war broke out. He volunteered immediately as a medical aide in the Belgian Army. After graduating M.B., Ch.B. with first-class honours in 1915 he became a surgeon lieutenant R.N. and served with great distinction for the rest of the war, being created O.B.E. and awarded the *Médaille du Roi Albert* by the Belgian Government.

[Bassano, Ltd.

At the end of the war he returned to Edinburgh as assistant pathologist at the Royal Infirmary and as lecturer in pathology at the university, where he proceeded M.D. (gold medal) in 1920 and D.Sc. in 1922. Findlay was a man of wide outlook, throwing himself with great energy into any project which interested him, and it was soon apparent that he possessed outstanding qualities as a research worker. In 1923 he joined the staff of the Imperial Cancer Research Fund, where he remained until he took up an appointment at the Wellcome Research Institution in 1929. At one time or another he held a Lister Research Fellowship, a Carnegie Research Fellowship, a Freeland Barbour Fellowship, and an Alice Memorial Fellowship. During the course of his researches he travelled all over the world, working for a time at the Pasteur Institutes in Paris and Tunis and in the Rockefeller Institute in New York. With problems of disease in Africa he was specially familiar. He was a member of the Foot and Mouth Diseases Research Committee.

The list of Findlay's publications (82 papers written by himself or in collaboration with others were published between 1930 and 1940 alone) shows how extraordinarily diverse were his interests, but in the nineteen-thirties his most important work was on yellow fever, particularly on the development of methods of immunization against this disease, which he was able to study in the Gambia. For this work he was created C.B.E. in 1935. Another of the diseases which he studied at this time was Rift Valley fever, on which he published several important papers. The subject of chemotherapy attracted him from his early days as a student, and the first edition of his book *Recent Advances in Chemotherapy* was published in 1930. The second edition appeared in 1939, and the first two volumes of the third edition have recently been published.

During the second world war Findlay was able to put his extensive knowledge of tropical diseases to most practical use. In 1940 he was sent first to Tunis to investigate trench fever and later to the Sudan and Abyssinia to continue his work on yellow fever. From 1942 to 1946 he was consulting physician to the West African Forces with the rank of brigadier. His important studies on the prophylaxis and treatment of malaria and blackwater fever won him further credit, and he also published papers on infective hepatitis. During the last two years he had been investigating the Coxsackie virus, publishing a paper on this in the *Journal* in 1950. Findlay became a member of the Royal College of Physicians in 1942 and was elected a Fellow in 1948. For some years he was honorary editor of the *Journal of the Royal Microscopical Society*—a society which paid him the honour of electing him its president in 1950. Besides being a prolific writer himself, he was interested in the problems of disseminating scientific information, and at the time of his death was chairman of the Abstracting Services Consultative Committee set up by the Royal Society.

Findlay took on the job of editor of the abstracting journals published by the B.M.A. for the first time in 1947. A man of remarkable versatility, he decided after some hesitation to leave the Wellcome Institution and come over to B.M.A. House. With his colleagues on the staff of the *B.M.J.* he worked out plans during the second half of 1946 for *Abstracts of World Medicine* and *Abstracts of World Surgery*, the mainstays of his team then being Dr. S. S. B. Gilder and Miss Marjorie Hollowell. The idea behind the abstracting journals was that they should provide the general reader with a current survey of what was best in the world's medical periodicals: the journals were selective in their choice of articles to be abstracted, and the abstracts long enough to be informative rather than merely indicative. Findlay wrote many abstracts himself, but his heart was really in the laboratory, this being reflected to some extent in the choice of articles to be abstracted. A quick and indefatigable worker, with an encyclopaedic mind, he did not really take kindly to all the detailed work involved in producing two monthly journals: his interests were too varied for this. In the lunch intervals he would spend his time in the laboratory, and, as an afterthought almost, he was engaged in writing his monumental *Recent Advances in Chemotherapy*. And at the end of the day he would be seen going home with a bundle of books from the London Library under his arm. His pen and his advice were always at the disposal of the *B.M.J.*, to which he had been an anonymous contributor before the war. In spite of this enormous pressure of work he was always urbane and unruffled, and had a certain boyish glee in recounting stories of the less dignified aspects of the private lives of eminent bacteriologists. He will be sadly missed by his colleagues in the Journal Department of the B.M.A., and their deep sympathy is extended to his widow and two daughters.

Dr. O. C. Carter, Chairman of the Journal Committee of the British Medical Association, writes: In the sudden death of G. M. Findlay the profession has lost a man of outstanding academic attainment, and the Association will mourn the passing of one of its very distinguished officials. When the B.M.A. was contemplating the publication of *Abstracts of World Medicine* it was not easy to find someone who, under the general direction of the editor of the *B.M.J.*, would be fitted both academically and from the literary point of view to be the editor of *Abstracts*. After

much thought and searching the Journal Committee, while in session, actually sent out one of its members to find Dr. Findlay and invite him to come to that committee. The search proved successful and Dr. Findlay came to see us, and, much to our great satisfaction, he agreed to undertake a very difficult task. Dr. Findlay not only succeeded in the work which he had set out to do, but by his charm of character and fund of knowledge he quickly gathered around him a large circle of friends who now will miss him sadly. The Association has lost a distinguished servant and will wish to extend to his widow the deepest sympathy in her great bereavement.

F. O. M. writes: With the passing of Marshall Findlay goes perhaps one of the most interesting figures in the field of virus research in Great Britain during the past 25 years. His interests and output of work ranged widely over biological and chemical investigations. Perhaps his greatest strength lay in the application of his facile pen and photographic mind to the collection and condensation of large subjects into accurate and readable accounts. The best examples of this were his *Recent Advances in Chemotherapy* and his chapters on "Variation in Viruses and Inclusion Bodies and their Relationship to Viruses" in Doerr and Hallauer's *Handbuch der Virusforschung*; and, of course, this talent was given great scope when he took on the editorship of *Abstracts of World Medicine*. But the call of the laboratory was still great, and he soon found a niche in the laboratories of the near-by Pharmaceutical Society, whence in his spare time he continued to send out papers recording the results of his investigations.

His work can be divided into several fairly distinct phases. His first researches, carried out in the laboratories of the College of Physicians at Edinburgh, were in the field of pathological and biochemical changes in experimental vitamin-deficiency, particularly avian beriberi and scurvy in guinea-pigs and rabbits. His own observations and those of many other workers at this time showed that animals were more susceptible to infection when on vitamin-deficient diets. As a result of his work on vitamins C and B he suggested that the lowered resistance might be due in part to degenerative changes and feeble leucoblastic reaction seen in the bone marrow and the lowered bactericidal power of leucocytic exudates.

At this stage he moved to the laboratories of the Imperial Cancer Research Fund in London, where, after a few brief experiments on the effect of tar and ultra-violet light on skin cancer, he embarked on the field of virus research which was his main interest from 1925 to his death. In collaboration with Ludford he published a pictographic review of the cell inclusions associated with certain ultramicroscopic diseases, and followed this with studies on the cytology of fowl pox. Later he found that fowl-pox virus grew in the same type of chick-embryo culture as Carrel and Rivers had used for vaccinia. This led him on to immunological and serological studies which confirmed the work of Levaditi and others that these two viruses were unrelated. He next entered the field of the virus aetiology of cancer and worked with several strains of infectious myxomatosis of rabbits. In 1929 he noted minute granules in the connective tissue cells of the lesions, around which controversy was centred at that time, but he came to no further satisfactory conclusion on whether or not they were the virus.

In 1929 Findlay joined the staff of the Wellcome Bureau of Scientific Research, where interest was focused on virus in relation to tropical disease rather than cancer. He joined with Hindle in the attack on yellow fever, work on which had recently entered a new phase as the result of the transmission of the disease to monkeys by Stokes and his colleagues in West Africa and Theiler's adaptation of the virus to mouse brain. They concentrated at first on trying to obtain a suitable vaccine, using killed virus from monkeys, and then, like the American workers, attempted immunization with living virus and immune serum. After a visit to the United States Findlay began work on the growth of yellow-fever virus in tissue culture; this provided a more suitable virus for immunization. Finally the 17D strain of virus was introduced from the Rockefeller Laboratories, and over the course of the next few years some thousands of Colonial Service employees were safely immunized against yellow fever.

These tissue-culture vaccines also contained "normal" human serum, and early in 1936 it became apparent that cases of jaundice were occurring in the recipients which were not due to yellow fever. These observations came to light at the same time as a report of jaundice in children receiving convalescent measles serum, but all attempts to isolate or determine the agent involved were unsuccessful; and, in fact, the incidents appeared to attract little outside attention. However, when this phenomenon appeared on a large scale in those receiving yellow-fever vaccine, multiple injections, and transfusions in the period 1939 to 1945, the work of Findlay and his colleagues formed a basis for further investigation. Findlay himself spent most of the war in West Africa, where he was consultant to the W.A.F.F., and found many opportunities to apply his energy and knowledge to problems of tropical medicine. When naturally occurring jaundice and that associated with yellow-fever vaccine appeared in the troops he seized the opportunity to renew investigations of this problem once more. In experiments on human volunteers he made the same observation as MacCallum and Bradley in England and Havens and his colleagues in the U.S.A., that stools from patients with infective hepatitis produced the disease when given by mouth to susceptible humans. In addition some of his volunteers were infected with urine, but he suggested that this was due to contamination by blood as a result of bilharzial infection. In his studies of the natural disease among the indigenous population he made the important observation that there was a much higher mortality among those on deficient diets. Thus he had returned to his original theme, and, in fact, some of his latest experiments were on the effect of Rift Valley fever virus on rats receiving a deficient diet.

Like most workers in the virus field, he collaborated with various colleagues in many unsuccessful searches for viricidal substances. Particularly was this so in relation to lymphogranuloma venereum. He also investigated the treatment of various tropical diseases—yaws, for instance—while in West Africa, and was quick to apply the newest antibiotics, such as chloramphenicol. In addition to all this he was the first to identify the virus of lymphocytic choriomeningitis in Great Britain, and with MacCallum recorded the first example of the interference phenomenon between two antigenically unrelated viruses.

It falls to the lot of few men to make truly original contributions in their scientific field, and Findlay's efforts were really never adequately rewarded in this respect. However, he added much to our knowledge of infectious diseases and stimulated many a worker both at home and abroad to intensify his efforts.

Professor G. A. H. Buttle writes: Dr. Findlay was one of the most energetic and hard-working men engaged in medical research. His knowledge of the literature was encyclopaedic and his enthusiasm for new investigation quite unfailing. Fifteen years ago he was the first to show the action of the sulphonamides in infections due to the large viruses, and he had always been anxious to extend the field of chemotherapy to the much more difficult problem of the small viruses. For the last few years of his life he spent much of his time investigating poliomyelitis and other viruses in mice. He worked along many different lines which suggested themselves on account of various physiological and pathological considerations; he was able to show a considerable antagonism between certain viruses while others potentiated one another. He also showed that there is a great decrease in the susceptibility of rats and mice to many viruses at the time the animals are weaned. At the time of his death he was engaged in an investigation of the influence of the hormones of the anterior pituitary and of the suprarenal cortex on the progress of virus infection.

Findlay was a most helpful and energetic colleague. He seemed to get an immense amount of work done in a very short time, and his life was so well organized that no time appeared to be wasted. The book which he was writing, *Recent Advances in Chemotherapy*, is quite the most comprehensive available account of the development of chemotherapy. The single volume he wrote in 1930 has grown into four volumes, two of which—the first on the chemotherapy of disease due to worms and to protozoa and the second on the chemotherapy of malaria—have already been published. He leaves us at the very height of his powers, and it is to be hoped that his work on the small viruses may be continued and extended until some means are found of controlling these infections.

Sir JOSEPH SKEVINGTON, K.C.V.O., F.R.C.S.

With the passing of Sir Joseph Skevington on February 29 at the age of 79 the Royal Borough of Windsor and the surrounding area lose a much beloved and respected resident and the medical world a distinguished surgeon. It was due chiefly to him that King Edward VII Hospital, Windsor, attained such high standing. He had remarkable foresight and driving force, and possessed the power to attract the sympathy of wealthy friends and patients towards the hospital, the main interest of his life; the plaques over wards and departments bear evidence of their generosity.

Born at Rothley in Leicestershire on February 2, 1873, Joseph Oliver Skevington was the son of J. H. Skevington, J.P., a farmer, and was educated at Oakham School and at St. Mary's Hospital, London, qualifying M.R.C.S., L.R.C.P. in 1898. He was house-surgeon to the late Mr. H. W. Page, upon whom he was to operate many years later. He obtained the F.R.C.S. in 1899 and a little later served in the Boer War as a civil surgeon to the South African Field Force. It is interesting to record that he took some of the first *x*-ray photographs ever to be taken in war.

Skevington settled in general practice in Windsor in 1903 and was elected to the staff of what was then the Windsor Royal Infirmary. His surgical practice developed rapidly and in six or seven years he was so overworked that he gave up general practice and confined himself to the work of a consulting surgeon, which included appointments at some nine hospitals of various sizes, among them being Maidenhead, Staines, Iver, Egham, Ascot, Windlesham, and Bagshot Cottage Hospitals.

In August, 1914, he went to Rouen as senior surgeon to No. 2 British Red Cross Hospital, but was invalided home in 1915. He returned to his work in Windsor and became surgeon to war hospitals in the vicinity and to the Brigade of Guards, Pirbright Camp, and Victoria Barracks, Windsor. In 1918 he returned to active service as a captain in the R.A.M.C. In 1919 he was created K.C.V.O.

Sir Joseph Skevington was a fine, hard-working, and conscientious surgeon who was much loved by his patients. He retired in 1936 after 33 years' service as honorary surgeon to King Edward VII Hospital, during which time he was also in charge of the *x*-ray department, an appointment he continued to hold until 1942. He was president of the Windsor and District Medical Society in 1929–30. During the last war he served his country a third time as a major in the Home Guard, and he was also chairman of the Berkshire Local Medical War Committee. He played golf and was captain of Sunningdale in 1931. Being extremely interested in flowers and gardens, he derived great pleasure from visits to Chelsea, Kew, and Wisley. Sir Joseph Skevington, who did not marry, was the only surviving member of his family, but there are many friends and patients who mourn him.—J. G. J.

C. KILLICK MILLARD, M.D., D.Sc.

Dr. C. Killick Millard, who was medical officer of health for Leicester from 1901 to 1935, died on March 7 at his home in Leicester, aged 81 years. Besides being a distinguished member of the public health service Dr. Millard was well known for his work for the Voluntary Euthanasia Legalization Society and for his views on vaccination against smallpox.

Charles Killick Millard was born on August 14, 1870, one of a family of nine. His father was the Rev. C. S. Millard, Rector of Costock, Notts. Educated at Trent College and Edinburgh University, Killick Millard graduated M.B., C.M. in 1892, proceeding M.D. in 1896 and D.Sc. (public health) in 1898. His first appointment was as resident medical officer at the Birmingham Fever Hospital during the severe epidemic of smallpox in 1893 to 1894, and he chose the subject of smallpox for his M.D. thesis. In 1896 he was promoted to be medical superintendent of the hospital, and held the position until 1899, when he became medical officer of health for Burton-on-Trent. Two years later he was appointed medical officer of health for Leicester.

Millard was not afraid of championing unpopular causes which he believed to be sound. Thus, while he was at the Birmingham Fever Hospital he carried out a statistical inquiry into the value of hospital isolation in reducing the prevalence and mortality of scarlet fever. He read a paper before the Society of Medical Officers of Health embodying the results of his inquiry, which, he contended, demonstrated the uselessness of this measure. His conclusions were strongly criticized at the time, but since then they have come to be fairly generally accepted. It was on the question of vaccination and smallpox that Killick Millard made his most distinctive stand. The town of Leicester had openly abandoned infant vaccination some 15 years before he went there as medical officer of health. Soon after his arrival smallpox was introduced into the town on several occasions, but the outbreaks were controlled without difficulty. It was because of this experience that Killick Millard felt compelled to modify his previously orthodox views about vaccination. He expounded his theory in a course of lectures given under the auspices of the Chadwick Trust, and these he afterwards published in book form in 1914 under the title *The Vaccination Question in the Light of Modern Experience*. His views about the effect of vaccination in protecting the infant did not differ from the orthodox view, and he gave a practical demonstration of his faith in the power of vaccination by taking his wife and two young children—all recently vaccinated—into the smallpox hospital and photographing them by the bedside of a patient with severe confluent disease. He was, however, against compulsory infant vaccination, and against mass vaccination as a means to control outbreaks of the disease. In his opinion the vaccination of all contacts was sufficient. He was of course prominent among those who welcomed the abandonment of compulsory vaccination when the National Health Service Act came into force in 1948.

In his later years he became interested in the question of voluntary euthanasia and may be said to have been the pioneer of the modern movement known by that

name. He was the honorary secretary of the Voluntary Euthanasia Legalization Society when it was founded in 1935. Lord Moynihan was its first president, and the society had the backing of a number of distinguished men in the Church and in the medical profession. The society promoted a Bill which was introduced by Lord Ponsonby in the House of Lords in 1936: this secured a good discussion, although it failed to attain a second reading. The subject was again discussed in the House of Lords about fifteen months ago.

Killick Millard was a man of the highest principles and received many professional honours during the course of his life. Besides being chairman of the Leicester and Rutland Division of the B.M.A. from 1923 to 1924 he represented his Division at a number of Annual Meetings, and was vice-president of the Public Health Section in 1909 and again in 1932. In the latter year he was also president of the Society of Medical Officers of Health, choosing the subject of voluntary euthanasia for his presidential address. In Leicester he was president of many local societies, including the Leicester Medical Society, the Leicester Literary and Philosophical Society, the Leicester Rotary Club, the Leicester Temperance Society, and the Leicester branch of the Band of Hope Union. At the age of 62, when others are considering limiting their activities, Killick Millard took up flying and obtained his pilot's certificate. On his 80th birthday he bought himself a motor-cycle and shortly afterwards toured Scotland on it. During the second world war he emerged from professional retirement to become temporary medical officer of health for the Blaby and Lutterworth Rural District, a post which he relinquished only a year ago. Dr. Millard married Miss A. S. Longley, daughter of the Vicar of Saltley, in 1899. His wife died in 1950. He is survived by two sons, the elder of whom is in general practice in Leicester, and two married daughters.

Mr. N. I. Spriggs writes: I knew Dr. Killick Millard for over 40 years, and I have seldom met any man with such enthusiasm and energy. Through his letters to the medical journals on temperance, vaccination, cremation, birth control, and voluntary euthanasia he must be known to hundreds of the profession who never met him personally. He was never afraid to champion an unpopular cause in public debate or in private conversation. I have heard it said (most unjustly) that he did not believe in vaccination against smallpox. The view he adopted when he was M.O.H. of Leicester was that, as many outbreaks of smallpox were initiated by a mild case in a person not sufficiently protected by vaccination, and as at least nine out of ten persons in Leicester were unvaccinated, or had only been vaccinated in infancy, he would rather deal with a population wholly unvaccinated, which (he held) would be unlikely to throw up mild and atypical cases of smallpox which might be missed. If, however, a case did occur, there was no one more energetic than Millard in tracing and vaccinating every contact.

Millard gave himself a motor-cycle on his 80th birthday, and soon after getting it he went to Scotland and back to visit a daughter. He enjoyed the trip, alleging that it was more exhilarating than sitting in a car. When asked why he unnecessarily used an "L" sign on his motor-cycle, however, he confided in me that he was not quite so agile as of yore, and that the L sign made others on the road more careful.

In his youth Millard had been interested in ornithology. Good specimens of rare birds stuffed by him some 60 years ago can still be seen at his home. Millard's life-long hobby, however, was gardening. When he was appointed M.O.H. at the age of 31 he went into a residence adjoining the Fever Hospital which had an acre of ground. This he converted with his own hands into a delightful garden, planting many fruit trees which are now quite large. In a pond, quite near the house, but well shaded, wild duck bred for many years, and were treated as pets by his growing family. The flower-beds, lawns, fruit trees, and vegetables were all attended to by himself alone till about two years ago. Also he had several beehives which he made and attended to himself. For some years he led a gardening "group" of the Rotary Club. The members met every month during the summer and discussed gardening matters, including the "compost heap," in which he was a firm (though not a fanatical) believer. One man who attended the group regularly, but who was no sort of gardener, when asked why he came, replied, "It does me good to see Dr. Millard's energy and enthusiasm, though he is much older than I. When I leave one of these meetings I feel years younger."

Perhaps the most outstanding feature in Millard's character was his conscientiousness and sense of duty: he would regard any attempt at tax evasion or similar action with loathing, and would always, when on official business, travel by the cheapest possible route so as to save public expense. He had a strong love of truth and a logical approach to any new problem rather unusual in an enthusiast, such as he certainly was.

Dr. E. B. Berenice Humphreys writes: The death of Dr. C. Killick Millard recalls to my mind many pleasant memories of an association which extended over a period of some 22 years. At the time when I joined the staff of his department in 1929 he was a national figure in the world of public health. He startled the daily newspapers with his presidential address to the Society of Medical Officers of Health by his views on voluntary euthanasia, while at the same time he was preparing for his local health committee a detailed report on the overcrowding in his city, illustrating his notes with actual photographs of families of eight and ten persons living in one room and enunciating a theory, at that time unorthodox, of differential rents as essential in any scheme of rehousing. He always contended that a new house alone would not suffice for these large families, unused to the amenities which would then be afforded to them. To many of them he was a constant and welcome visitor in their new surroundings; he it was who helped them to plan and to stock their new gardens. His car was often laden with plants and sacks of seed potatoes which he himself had raised for them. His garden was his greatest hobby, and all of us in the health department shared his joy in the beautiful flowers he brought for us almost each morning. We also remember the generous hospitality he and his gracious wife afforded to each and every member of the staff, how the year was punctuated with daffodil time, rose time, strawberry time, and chrysanthemum time. Fortunately for us he remained on in his home at "The Gilroes" after he retired, and so could spend more time working in his beloved garden. To the end he continued to share with us the fruits and flowers and the honey that his garden provided.

His very strict ethical sense forbade him to enter into any discussion on the work of the health department after he had retired, but his interest in public health remained undiminished. His work as a district medical officer in the County of Leicester kept him actively in touch with preventive medicine, and he was a regular attender at the monthly meetings of the East Midlands Branch of the Society of Medical Officers of Health at Nottingham. It was my privilege to drive him to these meetings, usually along a route in Leicestershire which was very familiar to him and recalled the scenes of his upbringing in a country rectory. He loved the countryside in every season of the year and taught me to appreciate, on that journey, the beauty of familiar trees in their nakedness in winter as well as their full leaf in summer. More than once in the autumn we have silently hastened back to be in time to see the sun go down over a familiar stretch of water on the edge of Charnwood Forest.

Last autumn he wrote me a note to say he was afraid that unless his health improved he would not be able to make these monthly journeys but that they would remain with him as very pleasant memories. Reluctantly at last he resigned himself to an indoor life and the novelty of his television set. But in the last weeks of his long and active life he came to cease to look back upon that life. Rather did he contemplate with faith and trust the unknown life that was to follow. And so, surrounded by a wealth of spring flowers which he himself had planted, he passed peacefully and confidently into that fuller life.

Sir RICHARD LUCE, K.C.M.G., C.B., F.R.C.S.

The death of Sir Richard Luce on February 22 was recorded in the *Journal* of March 1 (p. 493). We are indebted to Dr. F. G. Lescher, of Derby, for the following appreciation:

The death of Sir Richard Luce caused deep regret among his more senior colleagues in Derby and Derbyshire, who had worked happily with him. He had had deservedly a large consulting practice, and he was a friend to many doctors in the district. His greatest hobby was the study of military science. As a Territorial officer he founded the 1st North Midland Field Ambulance in 1909. His keenness was such that he invariably had with him a succession of military textbooks which he used to study when on his rounds and between seeing his patients. His Saturday afternoons and evenings were spent training the three field ambulances under his command, for he was one of those who considered a war inevitable. He was A.D.M.S. of the 46th Division at the outbreak of the first world war. Lord Allenby, who did not suffer fools gladly, was so struck by his ability and enthusiasm during his service in France that he took him to Egypt as D.D.M.S. of a corps. Later Lord Allenby insisted, in spite of opposition that Luce was a Territorial and not a regular officer, on his appointment as D.M.S. of the Egyptian Expeditionary Force, which included the Mediterranean area as well. With the rank of major-general, Luce was the first Territorial to occupy such a high post. It gave him his great opportunity, with the result that the medical service of this Army was raised to a peak of excellence unsurpassed in any other theatre of war. There had been some previous trouble in Egypt with the medical consultant services. Luce, since he was a wise doctor as well as a capable administrator, solved this; and the decorations which were bestowed on him were indeed well earned.

After the war, on his return to his surgical practice, he was elected president of the Derby Medical Society for the second time, an unprecedented honour. He still took an interest in military matters, being appointed honorary colonel of the medical services of the 46th North Midland Division. I remember taking him to an important divisional staff exercise. A difficult tactical problem, not a medical one, was being discussed, without a decision being arrived at. Luce was asked by the divisional general for his views. With the aid of a blackboard he gave a correct solution after a highly technical explanation. Had he not been a surgeon, Luce would have advanced far as a soldier.

His other hobby was medical politics, and at B.M.A. meetings he outlined a hospital policy not unlike the present one. It was for this mainly that he retired from the active staff of the Royal Infirmary, an institution which he loved and for which he had done so much, two years before his time would have been up, in order to enter Parliament.

W. F. FEDDEN, M.S., F.R.C.S.

Mr. W. F. Fedden, consulting surgeon to St. George's Hospital and to the Victoria Hospital for Children, died suddenly on March 12 at his home in Putney. His health had not been good in recent years.

Walter Fedde Fedden was the son of the late Samuel Fedden, and was born at Weston-super-Mare in 1879. He was educated at St. Paul's School under the celebrated and formidable F. W. Walker, whence he entered St. George's Hospital Medical School with a scholarship for his medical course. There he won many prizes and scholarships, and qualified in 1900. In 1902 he graduated M.B., B.S. of London University, with honours. He became F.R.C.S. in 1903 and obtained the M.S. in 1904. For a time he was attracted towards E.N.T. surgery, but soon turned to general surgery. After the usual resident appointments he became surgical registrar at St. George's, and then assistant surgeon, full surgeon, and consulting surgeon in the normal sequence. He retired from practice in 1935. For very many years he was surgeon to the Victoria Hospital for Children: his work there was, if anything, ever nearer to his heart than that at St. George's, and his handling of a sick child was an object-lesson in that not always easy art. He was also for a long time surgeon to the Bolingbroke Hospital, and during the 1939–45 war he emerged from retirement to resume surgical work there.

Fedden was a man of massive build, with big hands and a big head as well as a large frame. A certain deliberateness of movement and of speech was his habit; but it was far from an indication of a slow intelligence. His hands, too, were capable of most delicate and dexterous craftsmanship, and his operative technique was both carefully thought out and admirable in execution. Among his colleagues he was a man to whom many of them turned immediately for advice if they themselves or those near them stood in need of surgical care. As a teacher he was very conscientious and thorough, but rather eschewed the dramatic. During the 1914–18 war he served in the medical service of the Royal Navy as an officer of the R.N.V.R., and for a short time after the war he was on the Naval Medical Service Subcommittee of the Services Committee of the B.M.A. He had been an examiner in surgery for Cambridge and London Universities, and had edited the sections in *Gray's Anatomy* dealing with applied anatomy.

In 1921 he married Miss S. M. Haines, only daughter of the late Rev. William Haines. His wife survives him; there were no children of the marriage.

G. P. MILLS, F.R.C.S.

Mr. George Percival Mills, who died on March 7 at the age of 68, at his home at Shrawley, Worcestershire, had been living in retirement for several years. He was well known in Birmingham and throughout the Midlands, first as a general surgeon and later as an orthopaedic surgeon, and was for some years lecturer in orthopaedics in the University of Birmingham. Born at Walsall on July 18, 1883, he came from Harrow to the medical school at Birmingham, where he had a most distinguished career as a student. He qualified M.R.C.S., L.R.C.P. in 1906, and in the same year obtained the degrees of M.B., B.S. of the University of London, graduating with honours in zoology and surgery, and gaining the gold medal in anatomy. Two years later

he was admitted a Fellow of the Royal College of Surgeons of England. Except for a period as house-surgeon at the Hospital for Sick Children, Great Ormond Street, London, the whole of his work in general surgery was carried out at the General Hospital, Birmingham, where he steadily climbed the surgical ladder from house-surgeon to consulting surgeon, retiring in 1938. Mills was a skilful, patient, and ingenious craftsman. The problems of orthopaedic surgery always appealed to him, and an appointment on the staff of the Birmingham Orthopaedic Hospital gave him the opportunity to develop this work, which eventually became his main interest. There is no doubt, however, that his training in general surgery, the broader problems of which still intrigued him, gave him a sound and mature judgment in his specialty. His help was much appreciated by his colleagues in dealing with difficult cases of bone and joint disease and injury and with the problems of the wounded man. During the war of 1914–18 he spent three years in Serbia, with many of his colleagues from Birmingham, on the staff of the 47th General Hospital, where he saw more dysentery and malaria than surgical cases. For his services he was awarded the Serbian Order of St. Sava.

For many years Mills was a member of the Moynihan Chirurgical Club, and greatly enjoyed his visits with colleagues to many of the great surgical centres of Europe. His critical mind and independent outlook helped his fellow members to make a clear appraisal of the work they had been seeing, and these qualities made him a valued member of the party. Mills retired somewhat early in his professional career, owing to deterioration in health, but he maintained an active interest in the affairs of the countryside, which he deeply loved. His retirement was enriched by a happy home life, by his hobbies (of which fishing came first), and by a cultured taste in music and literature. He leaves a widow and two sons and two daughters. Both sons are members of the medical profession, in which they have already achieved distinction. Mrs. Mills and her family have the sympathy of their many friends.—S. G. B.

JOHN DUNDON, F.R.C.S., F.R.C.S.I.

Professor John Dundon, who died on February 24, at the age of 81, was born at Kilworth, Co. Cork, in 1871, the youngest son of Mr. Edmond Dundon, of Araglen Mills. He was educated at the Christian Brothers' College and at what was then Queen's College, Cork, where he was a senior exhibitioner and scholar. He graduated M.B., B.Ch., with first-class honours, at the old Royal University of Ireland in 1894. Dundon was appointed surgeon to the Mercy Hospital, Cork, in 1898, the year in which he was elected F.R.C.S.I., and from 1900 to 1915 he was surgeon to the North Cork Infirmary, to which he later became consulting surgeon. He occupied the chair of therapeutics and materia medica at University (formerly Queen's) College, Cork, from 1900 to 1927, when he became professor of surgery, holding the latter appointment until his retirement in 1940. He became a Fellow of the Royal College of Surgeons of England in 1905. Dundon was at one time an examiner in surgery for the Conjoint Board in Ireland and for some years was a member of the Irish Medical Registration Council, to which he was first appointed in 1927. He was a member of the Senate of the National University of Ireland from 1929 to 1939. When the British Medical Association met at Liverpool in 1912 he acted as secretary of the Section of Pharmacology and Therapeutics. He married May, youngest daughter of Mr. John M'Donnell, of Cork, in 1910.

A former student writes: Professor John Dundon was one of the outstanding medical men in the south of Ireland in this half-century; indeed, he was almost a legendary figure. Many of his operations were performed in private houses in remote country districts, involving long journeys from Cork. For many years he worked for sixteen to eighteen hours daily. He was an extremely dexterous operator, but did not believe in showmanship and never sought praise. His direct and logical approach to clinical problems caused students to crowd his ward-rounds long before he became professor of surgery in Cork in 1927. He was an excellent teacher, stimulating but never impatient or unkind. Indeed, his personal kindness matched his professional skill and he always avoided publicity in practising that virtue. His students and his patients ever found him tolerant and understanding. His was a truly great character.

C. E. BLOCH, M.D.

The death of the Danish scientist, Professor Carl Edvard Bloch, on February 11 comes as a reminder of the important part he played before, during, and just after the first world war in the discovery of vitamin A. He was born on September 21, 1872, and began to make his mark quite early in life by his studies, in association with Knud Faber, of pernicious anaemia and diseases of the intestinal tract. In his thesis, composed in 1902, "Studies of Intestinal Inflammation," he criticized the theory that pernicious anaemia is due to intestinal atrophy. In December, 1916, at a meeting of the Medical Society of Copenhagen, he presented the clinical evidence he had collected in support of his theory that xerophthalmia is due to lack of a nutritional factor present in fats. As pointed out in a recent Danish obituary notice, Bloch was the first to demonstrate by clinical observations the existence of vitamin A. This claim is not invalidated by the fact that McCollum and Davis, and Osborne and Mendel, had already demonstrated by experiments on animals the existence of a xerophthalmia-preventing vitamin. Their work, of which Bloch was ignorant at the time, did much to supplement and confirm his findings. Bloch was appointed acting Professor of Paediatrics in 1916, and "ordinary" Professor in 1931. He took an active part in the administrative work of the University in Copenhagen, and even after his retirement in 1943 he continued as an examiner in medicine at the University.

MICHAEL HESELTINE, C.B.

We record with regret the death on March 13, after a short illness, of Mr. Michael Heseltine, who was registrar of the General Medical Council from 1933 until June, 1951.

Michael Heseltine was born in 1886 in Norfolk, the son of the Rev. Ernest Heseltine. He was educated at Winchester and at New College, Oxford, where he read Greats. He was an accomplished classical scholar, and at a later date contributed to the Loeb Classical Library an admirable and idiomatic translation of Petronius. In 1909 Heseltine was appointed to the administrative class of the Home Civil Service, and after serving in the Office of Works and the Home Office was transferred

in 1912 to the newly constituted National Health Insurance Commission (England). Sir Robert Morant had gathered together a number of young administrators, many of whom afterwards rose to high rank in the public service, and among them Heseltine became known as one of the most able and promising. In 1919 he was awarded the C.B. After being seconded to the Ministry of Munitions and the Ministry of Reconstruction, Heseltine was transferred in 1919 to the newly established Ministry of Health, in which he served until 1933. In 1928 he was promoted to the rank of assistant secretary, and thereafter was largely responsible for the supervision of medical benefit under the National Health Insurance Acts and for the administration of insurance committees. Throughout his Civil Service career Heseltine's exceptional ability as a draftsman was given full scope in a series of appointments as secretary of important commissions and committees, including the Haldane Machinery of Government Committee (1917) and the Onslow Royal Commission on Local Government (1923–8). From 1928 to 1933 he represented the Minister of Health on the Dental Board of the United Kingdom.

In 1933 Heseltine left the Civil Service and became Registrar of the General Medical Council, and also of the Dental Board of the United Kingdom. He ceased to be registrar of the board on the appointment of a whole-time registrar in 1946, but remained registrar of the Council until June, 1951. During his long and distinguished tenure of office as registrar of the Council Heseltine had to deal with an immense variety of problems affecting medical education, medical registration, and medical discipline. Committees found him at all times experienced, resourceful, and imperturbable. During the war the Defence Regulation providing for the temporary registration of Commonwealth and foreign doctors threw an especial burden upon him at a time when the office of the Council had been bombed and staff was depleted. When evidence was required from the Council or the Board for such bodies as the Inter-departmental Committee on Medical Schools (Goodenough Committee) or the Inter-departmental Committee on Dentistry (Teviot Committee) his lucid and comprehensive memoranda, written in that dignified and rhythmical style of which he was a master, were often produced under conditions of considerable difficulty and pressure.

Heseltine's work as Registrar of the Council culminated in the passing of the Medical Act, 1950. In the Second Reading debate in the House of Lords Lord Hacking, who for 15 years had been a lay member of the Council, paid a special tribute to Heseltine "for the great part which he played from the very commencement of the discussions until their successful completion some months ago." After retiring from the post of registrar, shortly before his 65th birthday, Heseltine continued at the Council's request to conduct research and write on the history of medical education and other activities of the Council, and the office of Librarian was created for him for this purpose.

Dr. C. St. J. de Vere Shortt writes: All those who ever attended the clinical lectures of Dr. A. R. PARSONS will be deeply touched by his death, recorded in the *Journal* of March 8 (p. 549). He had a technique of his own, and the crowds of students who frequented his clinics testified to his popularity and his great gift of teaching medicine. At two minutes to nine every Monday, Wednesday, and Friday, not a minute later, Parsons would come into the hall of the Royal City of Dublin Hospital (known to students as Baggot Street) with his brisk walk, and immediately proceed to the ward where he was to give his lecture. From the moment he started he held one's interest, and if he did at times make you feel small before a class of students it was just "Alfie," and nobody minded, for everyone loved him and thought the world of him. He had the most marvellous memory. He would take the class to a bed where a patient was lying unconscious and proceed to give a complete list of every cause of unconsciousness which could be found in any textbook. His prescribing was superb, no mist. sod. sal. or other mists. for him. Every prescription was written out in full with meticulous care. His knowledge of skin diseases was unique. It would be impossible to forget his lectures: one moment he would be speaking in a tone of pathos and drama, and the next in tones of wonderment and astonishment, holding your interest till the last moment, when he would "reveal the oracle." Dublin has lost a great physician, an outstanding teacher, and one whose shoes it will be hard to fill. Hundreds of doctors who have been associated with him during the 58 years he has been physician to Baggot Street will feel that they have lost a great friend to whom they owe much of their learning, to whom they will be for ever grateful.

Dr. THOMAS HENRY BISHOP, of 94, Portland Place, London, died on March 2. He qualified M.R.C.S., L.R.C.P. in 1902 and worked for some time in Newcastle-upon-Tyne as medical officer to the City Dispensary. He took his D.P.H.(Durham) in 1905 and went to India as medical officer to the Kolar Gold Fields in the Bombay Presidency. Later he became chief medical officer to the Hardinge Bridge construction project. During this time he made a special study of cholera and described an original method of intravenous saline administration in the treatment of this condition. On the completion of the Hardinge Bridge he became chief medical officer of the Eastern Bengal State Railway. In 1914 he joined the I.M.S., from which he retired with the rank of Major in 1918. He spent the first year or more at the Indian Hospital in Brighton and was then sent to the Persian Gulf, where he spent the remainder of the war apart from when he was invalided home after two severe attacks of cholera. For some time he was civil surgeon of Basra and assistant director of the civil health services in Iraq. One of his patients was the influential Sheikh of Mohammerah, who requested the British authorities that Bishop should accompany him as his medical adviser on a pilgrimage to Ispahan. He thus became well acquainted with conditions and personalities throughout Persia and Iraq. After the war he returned to his post in the Indian State Railways and was elected president of the Railway Chief Medical Officers' Conference. During this time he made a detailed study of methods of water purification and published papers on the subject. On his retirement from India in 1928 he returned to England and occupied himself with a number of medical interests. He edited a journal called the *School Medical Officer*, spent a year in Canada, and renewed his Persian and Mesopotamian contacts. In 1935 he was appointed medical adviser to the Iraq Petroleum Company, a post which he held until his death. He was also medical adviser to Trinity College of Music. Though he was a humble man of simple tastes he had a great sense of loyalty and duty to his patients and those who came to him for advice. In his many contacts with specialists and consultants in the course of his work in the latter part of his career he was persistent and determined that the patient should derive the fullest benefit from the consultant's skill and experience. Though for some years he had been in failing health his only reaction to it was impatience and apprehension that it should interrupt his work. He was granted his greatest wish—to die in harness. He is survived by an only son, Dr. P. M. F. Bishop.

Medical Notes in Parliament

Preventing Burns

Mr. DENYS BULLARD, on March 14, moved the second reading of the Heating Appliances (Fireguards) Bill. He said its aim was to prevent the large number of accidents from burning in the home. These were perhaps the most serious of home accidents. The number of fatalities had been reduced by modern treatment, but, especially among old people and children, the number of serious or fatal accidents was still too high. All the deaths in the home were not the sole responsibility of the gas and electric fires and of the oil-stoves covered in the Bill. The open coal grate was still the greatest cause of fatal burning accidents in the home. The provision in the Children and Young Persons Act, 1908, placing a penalty upon parents of children involved in fatal accidents from fires in the home was not operative. The Bill empowered the Home Secretary and the Secretary of State for Scotland to lay down standards for the construction and fitting of guards to electric and gas fires and oil stoves. After an appointed day it would become an offence to sell any of these heating appliances unless they were adequately guarded according to the standards laid down.

Dr. SOMERVILLE HASTINGS, Dr. HORACE KING, and Dr. A. D. D. BROUGHTON supported the Bill, which was read a second time without a division.

Industrial Dermatitis

Dr. BARNET STROSS asked Mr. Peake on March 10 if he knew that some of his insurance officers appealed against every case in which a worker was certified to be suffering from industrial dermatitis, that there was a considerable delay before the worker was examined by the medical tribunal, and that certifying surgeons serve no useful purpose while this practice continued. Mr. OSBERT PEAKE replied that the great majority of claims for benefit for industrial dermatitis were decided by insurance officers on the basis of the examining medical practitioner's report.

Dr. EDITH SUMMERSKILL suggested that the trouble was partly due to a shortage of dermatologists. She asked Mr. Peake to bring this to the attention of the deans of the medical schools.

Mr. PEAKE promised to consider this suggestion.

Hospital at Aden

Mr. JOHN RANKIN inquired on March 12 why the plan for a new hospital at Aden had been abandoned, and when the tuberculosis wards to be built at Khormaksar would be ready for use. Mr. OLIVER LYTTELTON said this plan had not been abandoned. It was still proposed to construct a new 480-bed hospital at Khormaksar as rapidly as difficulties of finance and shortage of technical staff could be overcome. A sum of £600,000 was included in the present Aden Colony Development Budget towards the building of this hospital. Tuberculous patients were already adequately provided with wards at the present hospital, and would probably remain there until the major part of the new hospital had been built.

Prescription Charges

Mr. P. A. D. BAKER, on March 14, asked the Minister of Health to exempt from the prescription charge rural doctors dispensing their own prescriptions. Mr. H. F. C. CROOKSHANK replied that it was intended that the charge should be paid by the patient. He said it would not be equitable to exempt from the charge such patients as happened to get the medicine from dispensing doctors. Mr. Crookshank added that he was about to discuss the doctors' difficulties with the British Medical Association.

Medico-Legal

PENDULUM SWINGING

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

In his judgment in a case before the Circuit Court at Longford, in Ireland,[1] Judge Binchy stigmatized as "quackery and humbug" the conduct of J. H. Bennett, of Newtown Forbes, Longford.

The action was brought in respect of the death of Christopher Brogan, aged 33, from tuberculosis. Brogan was admitted to Longford Tuberculosis Hospital as an advanced case in January, 1950, but made good progress. When his relations visited him in June they found him reading a pamphlet entitled *T.B. Conquered*, by Bennett, and he expressed a wish to try the treatment offered in the pamphlet. The relations went straight to Bennett's house, and Bennett said he could cure him. He said he would *x*-ray him, and produced a string with a brass weight on the end which he swung in front of his face. Asked how he could *x*-ray an absent person with that, he said he could *x*-ray a person at the end of the world with it.

Bennett said that Brogan must leave hospital and go home, and gave the relations a jar of "medicine," warning them not to let any medical man get his hand on it, because he had refused to sell the formula to the Medical Board in Dublin, as it would be available only for rich people.

Brogan left hospital against the advice of the medical superintendent soon afterwards. He took the diet advised by Bennett—carrageen moss, boiled flaxseed, white of egg, and water. His relations visited Bennett's house several times. The pendulum was swung each time, and each time they were told there was a slight improvement in the patient. In October, 1950, Brogan died of pulmonary tuberculosis soon after Bennett had told his brother that he was completely cured and could get up.

In dismissing the action against Bennett on the ground that both Brogan and his parents had voluntarily submitted to Bennett's treatment, Judge Binchy said it was amazing that in the twentieth century someone could pretend to cure illness by twiddling the weight and pretend to tell the condition of the patient, whom he never saw from start to finish. Bennett's fee for the treatment was £20.

On March 12 the case came before the High Court at Longford, when Mr. Justice Kingsmill Moore reversed the previous decision.[2] He held that Brogan's death was caused or accelerated as a result of treatment and diet prescribed, and he assessed damages at £200, to be divided equally between the father and mother. He also agreed to state a case for the Supreme Court.

[1] *Scotsman*, November 2, 1951.
[2] *Daily Telegraph*, March 13, 1952.

Universities and Colleges

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on March 13, with the President, Sir Cecil Wakeley, in the chair, a Hunterian Professorship was awarded to Mr. K. W. Starr; the Hallett Prize was presented to Mr. J. C. N. Wakeley (King's College Hospital); and the award of a Streatfeild Research Scholarship to Mr. A. T. Andreasen was reported.

A Diploma of Fellowship was granted to Mr. Anthony Owen Parker, of Sydney, Australia. (Mr. Parker's name has been confused with that of Mr. Arthur Orfeur Parker, of Wonastow, near Monmouth, who last year was elected to the Fellowship without examination as a medical practitioner of at least 20 years' standing.)

A Diploma of Membership was granted to Mr. Anthony Peter Coats Bacon (St. Thomas's Hospital).

The following hospitals were approved for the surgical training of candidates for the Fellowship examinations of the College: Beckett Hospital, Barnsley, orthopaedic registrar, for six months. Pontefract General Infirmary, surgical registrar for one year; resident surgical officer and house-surgeon for six months.

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the final examination, were admitted L.R.C.P.Ed., L.R.C.S.Ed., and L.R.F.P.&S.Glas., on March 8: J. C. Aickin, I. S. Arthur, T. Awuku-Asabre, J. H. Beatty, J. Berlow, W. N. Brady, C. M. S. Calder, D. I. Cowan, J. Davies, Valerie P. Fogg, A. B. Gwan-Nulla, Mary Iball, Agnes Kramer, Catherine S. MacGregor, I. MacIntyre, Cecily R. Murray, Eileen Reddy, Ferenc Sandor, W. Scott, Sheila Sweeney, A. C. Thomson, W. Welsh, Joan W. Whitaker, S. M. Young.

Vital Statistics

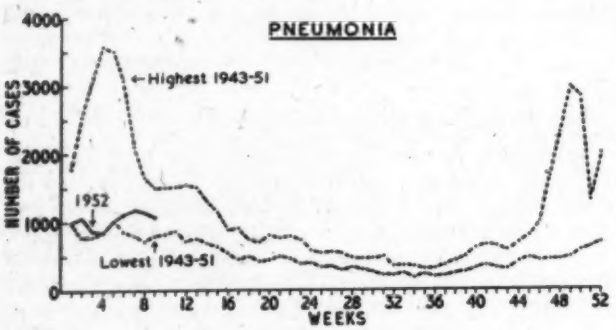
Smallpox in Lancashire

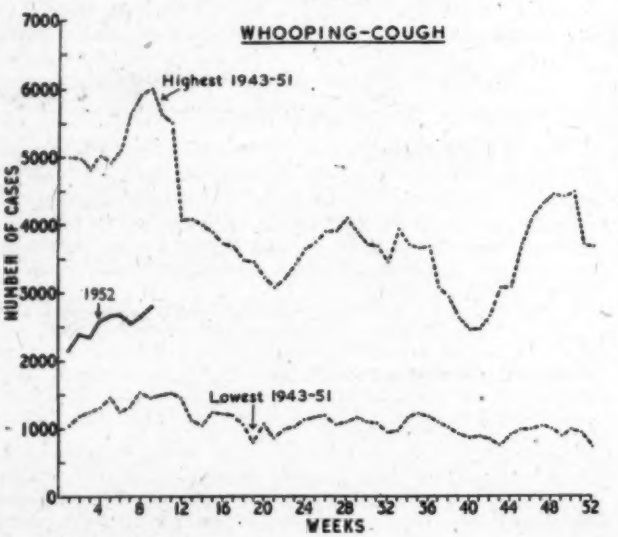
The infection of variola minor remains confined to Rochdale County Borough and the adjoining districts. Although numerous suspected cases had been investigated up to noon on March 18, there was no confirmation of the presence of the disease elsewhere in the country. Uncorrected notifications received at the General Register Office this year up to March 15 numbered 94. There have been no deaths.

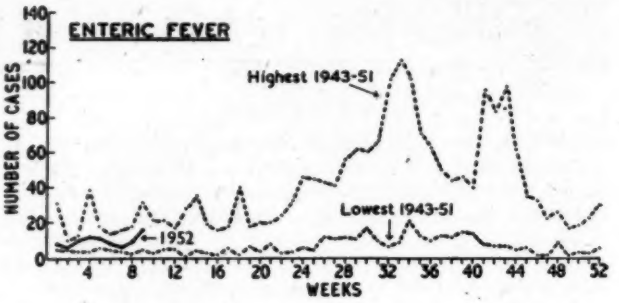
Notifications of smallpox received by the General Register Office this year are as follows: in the week ending February 16, 1; February 23, 18; March 1, 7; March 8, 62; and March 15, 6.

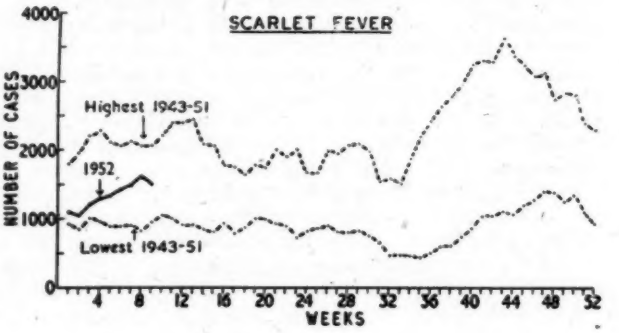
Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported during the nine years 1943–51 are shown thus --------, the figures for 1952 thus ————. Except for the curves showing notifications in 1952, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.









Infectious Diseases

In England and Wales during the week ending March 1 an increase was reported in the number of notifications of measles 499, whooping-cough 141, and dysentery 56, while a decrease was recorded for scarlet fever 107 and acute pneumonia 82.

The largest increases in the number of notifications of measles were Gloucestershire 147, Yorkshire East Riding 135, and Warwickshire 89, and the largest decrease was Staffordshire 159. Only small changes were recorded in the local trends of scarlet fever, with the exception of a decline of 61 in the number of notifications in Lancashire. The largest variations in the returns of whooping-cough were a rise of 32 in Surrey and in Essex. The number of notifications of diphtheria were 4 fewer than in the preceding week. The chief feature of the returns of diphtheria was a decline of 4 in Lincolnshire and Yorkshire West Riding.

The number of notifications of acute poliomyelitis were 6 more for paralytic cases and 1 fewer for non-paralytic cases than in the preceding week. The largest return was Lancashire 5 (Liverpool C.B. 3).

The number of notifications of dysentery was the largest reported for the past 38 weeks. The outbreak of dysentery in Norwich C.B. is at a constant level; 62 cases were notified in each of the past three weeks. In the past 15 weeks 1,118 cases have been notified from this city. The largest centres of infection during the week reviewed were Lancashire 101 (Manchester C.B. 24, Oldham C.B. 17, Swinton and Pendlebury M.B. 12); London 82 (Wandsworth 29); Norfolk 67 (Norwich C.B. 62); Middlesex 63 (Enfield U.D. 18); Glamorganshire 40 (Cardiff C.B. 40); Yorkshire West Riding 32 (Bradford C.B. 12); Northumberland 27 (Newcastle-upon-Tyne C.B. 21); Southampton County 26 (New Forest R.D. 19); Yorkshire North Riding 25 (Middlesbrough C.B. 25); Surrey 22 (Malden and Coombe M.B. 11); Essex 22.

Week Ending March 8

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,581, whooping-cough 2,918, diphtheria 38, measles 6,883, acute pneumonia 1,143, acute poliomyelitis 19, dysentery 639, and paratyphoid fever 6.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **March 1** (No. 9) and corresponding week 1951.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1952					1951				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	33	2	24	0	1	44	3	12	1	1
Dysentery	647	82	82	10		1,364	133	222	13	
Encephalitis, acute	3	2	0	0		8	1	2	0	
Enteric fever:										
Typhoid	4	2	0	0	2	4	0	1	1	0
Paratyphoid	12	0	3(B)	0		2	0	3(B)	0	
Food-poisoning	74	13		0		87	10		0	
Infective enteritis or diarrhoea under 2 years				12	16				21	28
Measles*	6,233	153	512	192	158	29,154	3315	358	82	121
Meningococcal infection	34	3	24	4	5	48	2	18	0	1
Ophthalmia neonatorum	31	1	9	0		57	6	15	0	
Pneumonia†	1,061	36	544	20	3	1,252	71	282	26	39
Poliomyelitis, acute:										
Paralytic	15	0	1	0	1	19	2	1	0	
Non-paralytic	4	1				9	2			
Puerperal fever§	274	40	14	2	1	69	3	8	1	
Scarlet fever	1,506	153	229	19	71	950	53	197	38	54
Tuberculosis:										
Respiratory			171	32				183	39	
Non-respiratory			36	2				22	3	
Whooping-cough	2,789	116	252	106	42	6,096	396	752	26	108

DEATHS in Great Towns	1952					1951				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	0	0		0	0	*0*	0	*0*	0	0
Dysentery	0	0		0			0		0	
Encephalitis, acute		0			0		0			0
Enteric fever	0	0		0		*0*	0	*0*	0	
Infective enteritis or diarrhoea under 2 years	15		0	0	0	*13*		*6*	3	1
Influenza	49	3	18	0	0	*178*	19	*7*	2	10
Measles		0		0	0		1	*0*	0	0
Meningococcal infection		1					0	*0*		
Pneumonia	354	48		14	19	*396*	55		8	15
Poliomyelitis, acute	1	0			0	*3*	0			0
Scarlet fever		0		0	0		0	*0*	0	0
Tuberculosis:										
Respiratory	170	30	32	3	17	*204*	33	*34*	5	11
Non-respiratory		3	4	0	2		4	*2*	4	2
Whooping-cough	0	0	1	0	0	*6*	0	*0*	1	2
Deaths 0–1 year	278	31	39	17	28	*288*	34	*48*	12	33
Deaths (excluding stillbirths)	6,630	975	739	150	238	*6,741*	1040	*756*	150	275
LIVE BIRTHS	7,756	1138	875	224	391	*7,337*	1169	*929*	224	433
STILLBIRTHS	220	16	28			*202*	26	*23*		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Medical News

The Rh Blood Groups and their Clinical Effects.—Under this title the Medical Research Council published in 1948 as Memorandum No. 19 a useful guide to the theory and practice of Rh group testing written by Drs. P. L. Mollison, A. E. Mourant, and R. R. Race. A revised edition was issued a few days ago as Memorandum No. 27. The changes are very minor, and consist chiefly in bringing the memorandum up to date with recent references. The new price (3s.) is, however, double the old, a sign of the sad way the cost of paper has risen in three years.

Employment of Older People.—The Minister of Labour told the House of Commons on February 21 that he had decided to set up a national advisory committee on the employment of older men and women. The names of those who will serve on the committee have now been announced; among them are Dr. G. E. Godber, of the Ministry of Health; Dr. E. R. A. Merewether, of the Ministry of Labour; Dr. J. H. Sheldon, director of medicine at the Royal Hospital, Wolverhampton; Dr. Donald Stewart, chief medical officer of the Austin Motor Company; and Sir Frederic Bartlett, director of the Psychological Laboratory at Cambridge.

Foot Health.—Britain's Second National Foot Health Week will be held from June 16 to 21. Since the first National Foot Health Week the Foot Health Educational Bureau has broadened the basis of its educational work, and its advisory panel now includes members from various professions concerned with foot care—medicine, surgery, chiropody, physical education—as well as members from the shoe and leather trades, together with observers from the Ministry of Health and the Ministry of Education. The purpose of the week is to give the general public guidance, in the simplest possible terms, on foot care and footwear. In addition to foot health news and articles in newspapers and periodicals, there will be a four-day exhibition in London, staged at the Exhibition Galleries, Army and Navy Stores, S.W.1, from June 17 to 20.

Federation to Help the Disabled.—In 1950 the World Veterans Federation was organized in Paris, operating under the United Nations, to help disabled ex-Servicemen. Through its international organization equipment available in the United States for those who have lost limbs or sight, for paraplegics and other paralysed patients, will be sent for distribution in 11 countries. Already the Federation includes some 14 million ex-Servicemen from 14 nations, and its principles, which include the maintenance of peace with freedom, have been accepted by nearly 90 member-associations. At the inaugural conference held in Belgrade last November—to which British ex-Servicemen's associations sent observers although Britain is not yet an official member of the Federation—the delegates decided to adopt as their major activity the rehabilitation of the disabled veteran. Mr. Kurt Jansson has been appointed director of rehabilitation and Dr. Harold Balme has been invited to become consultant adviser. The Federation, which has considerable funds at its disposal as well as much political influence in most countries, will work in close co-operation with both the United Nations and the World Health Organization. A conference is being planned to discuss plans of activity, and this will be held in Paris next month.

New Metabolic Ward at U.C.H.—The medical school and the majority of laboratories at University College Hospital are in a separate building across the road from the wards themselves. To make investigation and research easier a metabolic ward has now been opened in the hospital under Professor M. L. Rosenheim and Dr. C. E. Dent, where laboratories and bedrooms are adjacent in the same corridor, and studies of obesity and endocrine function can conveni-

ently be carried out without disturbing either patients or laboratory workers. This is particularly valuable at a time when biochemistry is ever-increasing in importance in clinical medicine. The ward is shared with Dr. E. E. Pochin's group, who are studying the therapeutic use of radio-isotopes (see also p. 648).

Sheriffs.—Drs. T. E. Jones-Davies and R. Davies Jones have been appointed Sheriffs for 1952 for Carmarthenshire and Montgomeryshire, respectively.

Emergency Bed Service: Applications and Admissions.—During the seven days ending March 17 the number of applications made by doctors to the London Emergency Bed Service for admission of patients was 989, of whom 87.05% were admitted.

COMING EVENTS

Ophthalmological Society.—The annual congress of the Ophthalmological Society of the United Kingdom will be held at the Royal College of Surgeons of Ireland, Dublin, from April 17 to 19. The annual dinner will be held at the Gresham Hotel on April 18, price 30s. per head; application should be made before March 29, and full details of the congress may be obtained from the secretary of the society, 45, Lincoln's Inn Fields, London, W.C.2.

Dietetics Congress.—The first international congress of dietetics will be organized from July 7 to 11 inclusive, in the Royal Tropical Institute, Amsterdam, Netherlands. Those interested are requested to apply for further details to Miss Diane J. Ten Haaf, General Secretary, Executive Committee, 13, Pomonaplein, The Hague, Netherlands.

Clinical Pathologists.—The annual general meeting of the Association of Clinical Pathologists will be held at Portsmouth (in the City Council Chambers) from April 3 to 5. Full details from the secretary, Dr. W. H. McMenemey, Maida Vale Hospital for Nervous Diseases, London, W.9.

International Haemophilia Society.—The annual general meeting of the society has been fixed for April 20, at 2 p.m., in the small assembly room of St. Pancras Town Hall. Any doctor who is interested is invited to attend, and full details are available from the society's office, the Old Fire Station (Top Floor), 94, Southwark Bridge Road, S.E.1.

Care of Old People Conference.—The National Old People's Welfare Committee announces that the sixth national conference on the care of the elderly will be held at the Olympia Ballroom, Scarborough, from April 3 to 5. Full details from the secretary of the committee, 26, Bedford Square, London, W.C.1.

Institute of Psychiatry.—Details of the lectures to be given to postgraduate students in psychiatry at the Maudsley Hospital during the term beginning on April 7 are now available from the secretary of the Institute, Maudsley Hospital, S.E.5.

Digestive Pathology Conferences.—A series of lectures and demonstrations on various aspects of digestive pathology will be held in Paris from May 26 to July 8, organized by the Faculté de Médecine de Paris and the Société Nationale Française de Gastro-entérologie.

May 26 to June 9: Liver and pancreas.
June 10 to June 23: Oesophagus, stomach, and duodenum.
June 24 to July 8: Intestines, rectum, and anus.

Full details from Dr. François Moutier, 78, rue de Monceau, Paris, 8e.

Radiology Courses.—The Faculty of Radiologists is organizing courses for the candidates for the D.M.R.D. and D.M.R.T. (R.C.P.Lond. and R.C.S.Eng.), beginning in October. Further details may be found in the advertisement columns.

Prize for X-ray Therapy.—A David Anderson-Berry silver-gilt medal, together with a sum of money amounting to about £100, will be awarded in 1953 by the Royal Society of Edinburgh to the person who in the opinion of the council has recently produced the best work on the therapeutical effect of *x* rays on human diseases. Applications may be based on both published and unpublished work and should be accompanied by copies of relevant papers. They must be sent to the general secretary, Royal Society of Edinburgh, 22, George Street, Edinburgh, 2, by March 31, 1953.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Friday, March 21

SOCIETY OF CHEMICAL INDUSTRY: FINE CHEMICALS GROUP.—At King's College, Strand, London, W.C., 7 p.m., A.G.M.; 7.30 p.m., "*The Physico-chemical Aspects of Drug Administration*," by Dr. N. Evers.

Monday, March 24

MANCHESTER MEDICAL SOCIETY: SECTION OF GENERAL PRACTICE.—At Large Anatomy Theatre, Medical School, Manchester University, 9 p.m., "*The Problem of Peptic Ulceration in General Practice*," by Dr. C. E. S. Lynch.

MANCHESTER MEDICAL SOCIETY: SECTION OF ODONTOLOGY.—At Manchester Dental Hospital, 5 p.m., "*A Study of the Innervation of the Developing Tooth-germ, with Reference to the Innervation of Dentine*," by Mr. F. T. Monks.

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, Cavendish Square, W.—8.30 p.m., pathological meeting.

SOCIETY FOR ENDOCRINOLOGY.—At Royal Society of Medicine, 1, Wimpole Street, London, W., 5.30 p.m., "*The Role of the Adrenal Cortex in Homoeostasis*," by Dr. D. J. Ingle (Michigan, U.S.A.).

Tuesday, March 25

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—5.30 p.m., "*Enzymic Mechanisms in Skin*," by Professor R. H. S. Thompson.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—5 p.m., "*Familial Intestinal Polyposis*," Hunterian Lecture by Professor C. E. Dukes.

WEST END HOSPITAL FOR NERVOUS DISEASES, 40, Marylebone Lane, London, W.—5.30 p.m., "*When the Electroencephalograph Helps*," by Dr. Douglas Gordon.

Wednesday, March 26

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—5.30 p.m., "*Animal Parasites in Dermatology*," by Dr. J. O. Oliver.

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, Endell Street, London, W.C., 4.30 for 5 p.m., "*Physical Aspects of Radiotherapy*," by Mr. S. B. Osborn.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—3.30 p.m., "*Malformations and Irregularities of the Teeth and Jaws in Children*" (Illustrated), by Miss Rosamond Caseley, L.D.S. R.C.S.

Thursday, March 27

CHADWICK TRUST.—At Public Library Lecture Hall, Chesterfield, 7.30 p.m., "*Public Health—A Comparison Between the Age of Chadwick and Our Own*," Chadwick Public Lecture by Mr. S. E. Finer, M.A.

●INSTITUTE OF CHILD HEALTH, Hospital for Sick Children, Great Ormond Street, London, W.C.—5 p.m., "*Surgery of Chest Disease*," by Professor R. S. Pilcher.

INSTITUTE OF PSYCHIATRY, Maudsley Hospital, Denmark Hill, London, S.E.—3 p.m., "*Affective Epilepsy*," public lecture by Professor L. van der Horst (Amsterdam).

LIVERPOOL MEDICAL INSTITUTION, 114, Mount Pleasant, Liverpool.—8 p.m., annual and ordinary meetings. Election of President and Officers. "*Cerebral Abscess*," by Mr. R. H. Hannah.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 11, Chandos Street, W., 8.30 p.m., "*Acute Nephritis*," by Professor M. L. Rosenheim.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—5 p.m., "*The Status of Lymphadenoid Goitre. Hashimoto's and Riedel's Disease*," Hunterian Lecture by Professor T. Levitt.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, Lisle Street, Leicester Square, London, W.C.—4.15 p.m., demonstration and discussion of clinical cases.

Friday, March 28

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—5.30 p.m., "*Benign New Growths*," clinical demonstration by Dr. H. Gordon.

●INSTITUTE OF DISEASES OF THE CHEST AND INSTITUTE OF CARDIOLOGY.—At London School of Hygiene and Tropical Medicine, Keppel Street, W.C., 5.30 p.m., "*Constrictive Pericarditis*," by Dr. William Evans and Mr. Vernon C. Thompson.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, London, W.C.—4.30 p.m., clinical discussion for general practitioners. "*Cancer of the Larynx*," by Professor F. C. Ormerod.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos Street, London, W.—7.30 p.m., general meeting. "*Fatal Syphilis*," papers by Dr. G. L. M. McElligott and Professor W. D. Newcomb. A discussion will follow.

ROYAL INSTITUTE OF CHEMISTRY: NORTH WALES SECTION.—At Imperial Buildings, Regent Street, Wrexham, 6.30 p.m., "*Cortisone*," by Professor C. W. Shoppee, D.Sc., D.Phil.

Saturday, March 29

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Courtauld Lecture Theatre, Middlesex Hospital, Mortimer Street, W., 2.30 p.m., clinical meeting by Miss Diana Beck.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Brown.—On March 8, 1952, at Mary's Meadow, Guildown, Guildford, Surrey, to Barbara (formerly Jacobs), M.R.C.S., L.R.C.P., wife of David Fergrieve Brown, a sister for Richard—Janet Filmer.

Ewing.—On February 22, 1952, at St. Anne's Nursing Home, to Evelyn, wife of Dr. Richard F. Ewing, of 1, White Road, Cowley, Oxford, a sister for Michael Charles.

Habibis.—On March 2, 1952, at the Princess Beatrice Hospital, to Dr. Stella Murray, wife of Dr. H. S. Habibis, a daughter.

McNeill.—On February 26, 1952, at the Simpson Memorial Maternity Pavilion, Edinburgh, to Margaret (formerly Buchanan), wife of Dr. Ronald S. McNeill, 33, Colinton Mains Place, Edinburgh, a son.

Morrison.—On February 22, 1952, at Bankhall Maternity Hospital, Burnley, Lancs, to Dr. Agnes Morrison, wife of Dr. Arthur Blakemore Morrison, a daughter.

Valentine.—On March 3, 1952, to Pamela, wife of Dr. G. H. Valentine, M.R.C.P., D.C.H., of Market Deeping, Lincs, a daughter—Nicola Gay.

MARRIAGES

Carré—Forshaw.—On February 23, 1952, at Weybridge, Surrey, Ivo John Carré, M.B., M.R.C.P., D.C.H., to Pamela June Sutherland Forshaw.

DEATHS

Bassett.—On March 4, 1952, Frank Pickering Bassett, L.R.C.P.&S.Ed., L.R.F.P.S., of St. James Road, Surbiton, Surrey, late of St. Helens, Lancs, aged 89.

Blakely.—On February 24, 1952, at Sheffield, John Blakely, M.B., Ch.B.

Browne.—On March 3, 1952, at Wells, Somerset, Ada Margaret Browne, L.S.A., of 25, Denton Road, Wokingham, Berks.

Bullough.—On March 4, 1952, at 57, Hall Lane, Hindley, near Wigan, Fred Bullough, M.B., Ch.B., aged 75.

Dickson.—On March 14, 1952, at his home, 55, The Broadway, Thorpe Bay, Essex, James Dickson, M.C., M.B., Ch.B.

Dodgson.—On March 4, 1952, at Maldwyn, Conway, Caern., Robert William Dodgson, O.B.E., M.D., M.R.C.P., aged 81.

Doorly.—On March 13, 1952, at his home, Arthur Rawdon Carrington Doorly, M.B., B.S., of Surbiton, Surrey.

Jones.—On February 23, 1952, at Llwyn Onn, Holywell, Flints, Arthur Owen Jones, M.R.C.S., L.R.C.P., aged 54.

Jones.—On March 6, 1952, at 41, Shoot-up Hill, London, N.W., Edmund Benjamin Jones, F.R.C.S., L.D.S., aged 83.

Leverton-Spry.—On March 3, 1952, at his home, St. Keverne, Helston, Cornwall, Edward Leverton-Spry, M.R.C.S., L.R.C.P., aged 72.

Mack.—On March 14, 1952, in a flying accident, Edward Wintrip Forsyth Mack, M.R.C.S., L.R.C.P., Squadron Leader, R.A.F.

Martyn.—On March 4, 1952, at Moulton, Lincs, Frank de Récourt Martyn, M.R.C.S., L.R.C.P.

Meredith.—On March 7, 1952, at the Johns Hopkins Hospital, Baltimore, Maryland, U.S.A., Lida Orem Meredith, M.R.C.S., L.R.C.P.

Mills.—On March 7, 1952, at his home, Shrawley, near Worcester, George Percival Mills, M.B., F.R.C.S., aged 68.

Munden.—On March 8, 1952, at Eastcombe, Stroud, Glos, Marwood Mintern Munden, M.R.C.S., L.R.C.P.

Orr.—On March 2, 1952, in a nursing-home, Ada Annie Hatchard Orr, M.B., Ch.B., of 2, South Learmouth Avenue, Edinburgh.

Osburn.—On March 7, 1952, at Bournemouth, Arthur Carr Osburn, D.S.O. and Bar, M.R.C.S., L.R.C.P., Lieutenant-Colonel, R.A.M.C., retired, aged 75.

Pearson.—On February 25, 1952, at 40, Portland Road, Leicester, Dudley Garencières Pearson, M.B., B.C.

Pennefather.—On March 15, 1952, Richard Dymoke Pennefather, L.R.C.P. & S.I. & L.M., of Herne Hill and Haywards Heath, latterly of Kentwyns, Horsham, Sussex.

Stirk.—On March 10, 1952, Percy Herbert Stirk, M.R.C.S., L.R.C.P., D.P.H., aged 83.

Stockwell.—On March 9, 1952, at 3, The Grove, Roundhay, Leeds, George Ephraim St. Clair Stockwell, M.B., B.Ch., aged 75.

Thorold.—On March 4, 1952, at 3, Bathwick Hill, Bath, William Grant Thorold, M.R.C.S., L.R.C.P., Major, I.M.S., retired, aged 89.

Trist.—On March 11, 1952, at St. Mary's Hospital, Clifton, John Ronald Rigden Trist, M.C., M.R.C.S., L.R.C.P., of 120, Henleaze Road, Bristol.

Vint.—On March 6, 1952, at his home, Cranethorpe, Strandtown, Belfast, Edward Thomas Vint, M.B., B.Ch., Major, R.A.M.C., retired, aged 85.

Watson.—On March 5, 1952, at 32A, Brunswick Terrace, Hove, Sussex, William Watson, L.R.C.P.&S.Ed., L.R.F.P.S., late of Holbeach, Lincs, and Cambridge, aged 81.

Whyte.—On February 27, 1952, at the Leicester Royal Infirmary, Alexander Whyte, M.B., Ch.B., D.P.H., aged 43.

Young.—On March 5, 1952, at 10, Manchester Road, Bury, Lancs, David Hunter Dow Young, M.B., Ch.B.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

When Should a Child be Dry?

Q.—*At what age should a child acquire bladder control? Is there anything unusual in a girl of 3 years being still wet both during the day and at night? What steps can the parents take to assist the child? At what age is a full medical investigation warranted?*

A.—The average child should have acquired permanent bladder control by the age of 4. There is, however, a very wide range of variation, and it is perfectly normal for a child to have acquired day and night control by the age of 18 months and yet relapse as its interests widen; nevertheless day and night control should again be established during the fourth year. If the girl in question is still being wet day and night at the age of 3 it is essential to know if she has actually been dry for perhaps two hours during the day and *ever had one single dry night.* If this is so, it is unlikely that there is any organic disease provided the urine is normal. If, however, the child is persistently wet all the time and has never had dry spells, then full investigation should take place at once. Constipation and infestation with worms are common factors, but day wetting at the age of 3 is more often due to carelessness and the distraction of other things. Parents are most likely to succeed in dealing with the problem by regular training in the daytime—that is, sending the child to pass water at gradually increasing intervals, starting with half an hour, so that at no time does she ever experience the urgency to void. When the child manages two-hour intervals by day it is likely that she will start being dry at night. Quite a number of children of this age, however, are wet in the daytime and dry at night simply because they do not bother; in these circumstances parents should not be afraid of disciplining them.

Proctalgia Fugax

Q.—*Could you please advise on the aetiology and treatment of the following condition:*

The complaint is one of severe and sudden attacks of pain in the rectum at infrequent and irregular intervals. It most frequently occurs at stool, but may occur at any time even during the night, wakening the sufferer. I have known some patients to faint with it. Attacks last from two to five minutes, and, though the whole rectum seems involved, a focal point of severity can often be described as "working its way right round the rectum." The patient is left limp after an attack. Most of the cases have been healthy young adults free from haemorrhoids, constipation, and anal fissure. Both men and women are affected.

A.—It would appear that this is a case of proctalgia fugax. The cause of the condition is unknown, but it is probably due to spasm of the pelvic floor muscles. It often occurs in patients who are anxious or overworked, and it is not uncommon in those who fear the development of a rectal carcinoma.

The writer has had the opportunity of examining a patient during an attack, and he has no doubt that the pain is due to muscle cramp.

Regarding treatment, the patient should be reassured. When an attack occurs it can often be stopped by simple dilatation of the anal canal by the passage of a finger into the rectum. A more severe attack can be terminated very

quickly by injection of a small quantity of air into the rectum through a rubber catheter, using a Higginson syringe. The patient is advised to keep some finger-stalls and/or a catheter and syringe at the bedside in case he should have a sudden attack. Some patients appear to be relieved by the insertion of an antispasmodic suppository.

Vanishing Creams

Q.—*Many proprietary ointments are made up in a vanishing-cream base and are not messy to apply. Can the ordinary skin medicaments be incorporated in a vanishing-cream base? If so, what is the composition of the base? What is Halden's emulsifying base?*

A.—Many common medicaments can be incorporated in a vanishing cream type of base such as unguentum emulsificans *B.P.* (anhydrous) or unguentum emulsificans aquosum *B.P.* The former preparation is made from emulsifying wax which contains cetostearyl alcohol and sodium lauryl sulphate, and when mixed with water gives an oil-in-water emulsion resembling a vanishing cream. The following compounds are incompatible with this type of base: phenol (above 1%), mercurous chloride, ichthyol, sublimed sulphur, solution of coal tar, acridine antiseptics.

The preparation known as Halden's emulsifying base, described by Mumford (*Brit. J. Derm. Syph.*, 1938, **50**, 540), has the following formula: liquid paraffin 3 g., white soft paraffin 2 g., "lanette wax SX" 2 g. A modification by Soulsby (*Brit. J. Derm. Syph.*, 1940, **52**, 25) is: liquid paraffin 50 g., white soft paraffin 20 g., "lanette wax SX" 30 g. The addition of 5% of anhydrous wool fat is said to improve these bases. ("Lanettè wax SX" is a proprietary preparation which is very similar to the emulsifying wax of the *British Pharmacopoeia*, and the above bases closely resemble the official unguentum emulsificans.)

The following are the main advantages of these oil-in-water emulsifying bases: (*a*) they are miscible with sweat and serum and do not clog the pores; (*b*) they are readily washed from the skin and are less liable to soil clothes than the more fatty bases; (*c*) many antiseptics are more active in this type of base than in purely fatty bases; (*d*) they are readily absorbed.

For a comprehensive survey of this subject see *Report of a Symposium on New Emulgents and Ointment Bases*, British Pharmaceutical Conference, 1947 (*Quart. J. Pharm.*, 1947, **20**, 481).

Albuminuria in Gout

Q.—*(1) Does the fact that a gouty subject has albumin in his urine and polyuria contraindicate the use of cinchophen? (2) Would the use of cinchophen, if permissible, get rid of uric acid deposit in the kidneys or lessen the amount of urine and albumin passed? (3) Is there evidence that the newer forms of cinchophen are less liable to damage the liver than cinchophen itself? (4) How does the presence of a moderate amount of albumin in the urine and the polyuria affect the prognosis?*

A.—(1) Some albuminuria and polyuria do not contraindicate the use of cinchophen, the drug being much more deleterious to the liver than to the kidneys.

(2) It is unlikely that a large uric acid deposit in the kidneys would be affected by cinchophen, nor would cinchophen lessen the amount of urine or albumin passed.

(3) The evidence that the newer analogues of cinchophen are less deleterious to the liver than cinchophen itself is inadequate.

(4) If the albuminuria and polyuria are expressions of a progressive glomerulonephritis, the prognosis becomes correspondingly more grave. It is aggravated depending on the degree to which renal function has been reduced and the extent of the associated hypertension.

Fertility after Prostatectomy

Q.—*Are contraceptives necessary after enucleation of the prostate?*

A.—It is the usual practice of most surgeons to divide and doubly ligate both vasa at the time of prostatectomy, and following this procedure the patient would certainly be infertile.

If prostatectomy alone has been done it is not quite so easy to give a dogmatic answer, although it is often stated that the patient is potent but infertile. There are two important factors to be considered. First, incompetence of the internal vesical sphincter results in the semen running into the bladder instead of being ejaculated normally. The semen would then be passed together with the next specimen of urine. Secondly, in the absence of prostatic secretions the spermatozoa might not attain full motility. With regard to the first of these points it should be emphasized that the internal sphincter may not always be incompetent; regarding the second point, it must be remembered that the whole of the prostate has not been removed and that some functioning tissue usually remains. Bearing these facts in mind, it may be said that, while there is thus theoretically a risk that a patient might father a child after prostatectomy, the chances are so remote as to make contraceptive measures unnecessary.

NOTES AND COMMENTS

Acrocyanosis.—Dr. A. W. BAUER (London) writes: Might I make a small addition to your expert's answer about acrocyanosis ("Any Questions?" February 16, p. 396)? Certainly "priscol," nicotinamide, and hexamethonium should be given a trial, but, as your expert remarks, the effective dose usually produces other circulatory symptoms (and side-effects) which render the drugs useless in practice. Modern developments have provided us with a harmless and excellent weapon to combat peripheral circulatory disorders such as *digiti mortui*, acrocyanosis, Raynaud's and Burger's diseases: ultrasonic therapy; and this should definitely be contemplated before embarking on surgical intervention. See Buchtala, Suthlfauth, Tschannen in the special issue on ultrasonics in the *British Journal of Physical Medicine*, January, 1952. Up to the present I myself have had no failure in eleven cases (one acrocyanosis, three Raynaud's disease, and seven *digiti mortui*).

Geographical Tongue.—Dr. DEAN A. SMITH (London) writes: In view of the world-wide circulation of the *British Medical Journal*, may I suggest an addition to your expert's answer on geographical tongue ("Any Questions?" February 23, p. 448)? In many parts of the Tropics and subtropics the commonest cause of geographical tongue is nutritional ill-health. There is much evidence relating the condition to riboflavin deficiency, but it is probable that lack of other factors of the vitamin-B complex, particularly pyridoxin, may contribute. Treatment with a good source of the whole complex, such as yeast, is successful in the great majority of cases.

Dr. A. ROITH (Colchester) writes: In the answer on the causes and treatment of geographical tongue no mention was made of the fact that in children, at least, this condition is invariably due to chronic indigestion, and the condition will gradually clear up as the state of digestion improves with the appropriate treatment.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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